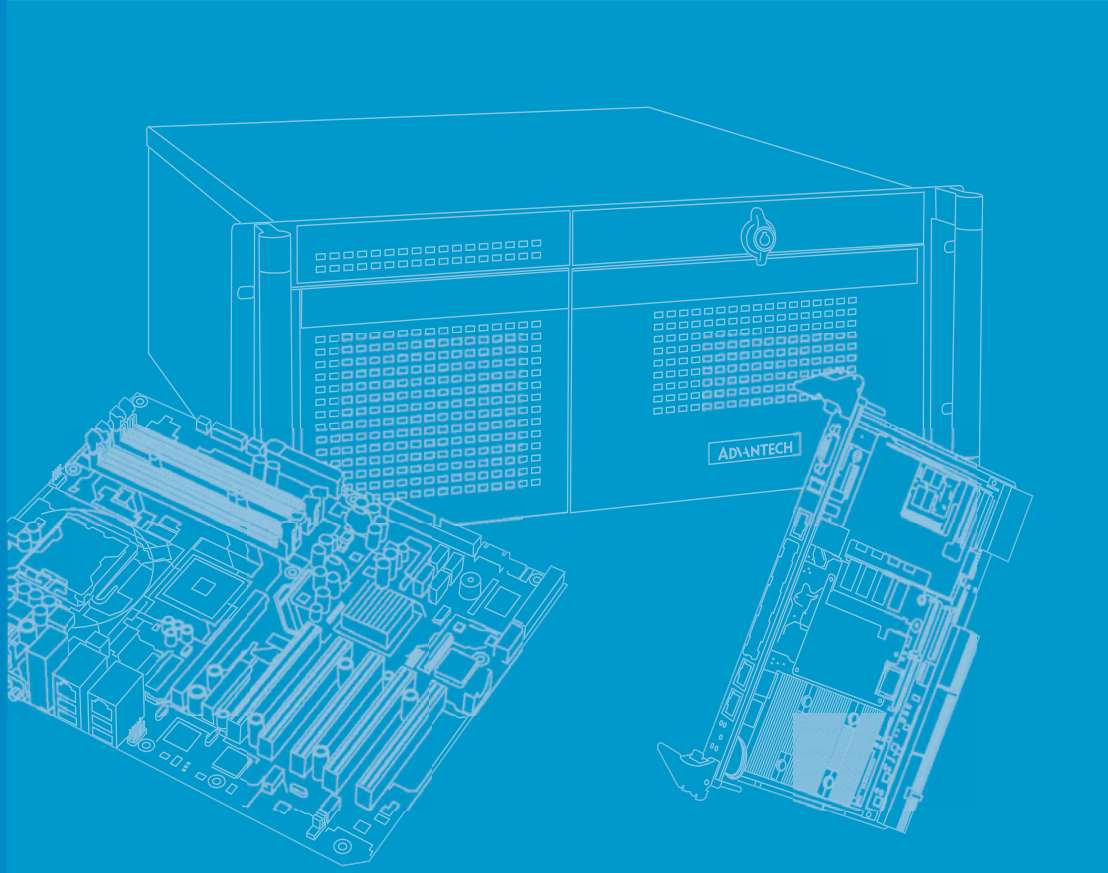

User Manual

MIC-3397

6U CompactPCI® 3rd Generation Intel® Quad-Core Xeon® & Dual-Core Pentium® Processor Blade with ECC support

ADVANTECH

Enabling an Intelligent Planet

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No. 200K339700 Edition 1

Printed in China December 2014

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g. There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- MIC-3397 all-in-one single board computer (CPU heatsink, PCH heatsink & MXM heatsink, and E6760 MXM Type A module optional included) x1
- Daughter board for SATA HDD & SATA bracket (assembled) x 1
- Solder-side cover (assembled) x1
- HDD screws x 4, CFast screw x 1, RJ45 to DB9 cable x1 (accessories)
- Warranty certificate document x1
- Safety Warnings: CE, FCC class A

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- ESD (electrostatic discharge) can cause either catastrophic or latent damage in sensitive electronic components. Take appropriate measures to ensure that any accumulated body charge is removed before accessing electronic devices. A static-safe workbench is ideal.

We Appreciate Your Input

Please let us know of any aspect of this product, including the manual, which could use improvement or correction. We appreciate your valuable input in helping make our products better.

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Chapter 1

Hardware Configuration

This chapter describes how to configure MIC-3397 hardware.

1.1 Introduction

Advantech's MIC-3397 series is a 6U CompactPCI single board computer with Intel® Quad-Core Xeon® E3-1125C v2 (40W)/E3-1105C v2 (25 W) server class processor, and Intel® Dual-Core Pentium® B925C (15 W) low power dissipation processor, with DH8900 chipset that supports DMI1.0 x 4 FSB. The processor uses Intel® 22nm 64 bit process technology, with up to 2.5 GHz clock speed, 8 MB L3 cache featuring Intel® Hyper-Threading, Virtualization, Trusted Execution Technology, which enables the board to meet the highest standards for the management and security of high-availability applications. It supports dual-channel ECC memory, up to 16 GB DDR3 of 1333/1600 MHz with max 8 G on board and 8 G SO-DIMM memory, three 2.5" Serial ATA interfaces (one on board optional with one 8 GB NAND flash, two to RTM), one Cfast slot, five Gigabit Ethernet ports (two on front panel, two to PCIMG2.16, two to RTM with one optional on front panel), six USB2.0 ports (three on front panel, three to RTM), two VGA ports (one on front panel, one to RTM) on 4HP, three COM ports (one to front panel, two to RTM), one PS/2 port, and one PCIe2.0 x4 interface reserved for user defined rear transition module.

MIC-3397, is designed in single slot (4HP) and dual slot (8HP) form factor widths. The 8HP version provides rich and extensive I/O support, features high-performance discrete graphics using AMD Radeon E6760 GPU, supports 1 GB GDDR5 at PCIe x1, x2, x4, x8, and x16 lane widths, 2.5 GT/s and 5.0 GT/s link-data rates, up to four display outputs including one DVI-I, one DVI-D port, and two DP 1.1 or 1.2 ports in a MXM 3.0 type A form factor.

MIC-3397 Series can be installed in a standard CompactPCI system slot as system master, or in a peripheral slot as stand-alone server blade without CompactPCI bus communication; it meets harsh environment application standards, and should be attractive to multiple markets ideally suited for datacom, telecom, and military applications. Its outstanding graphics design will fill opportunities for image-processing in medical, defense system, and many other vertical segment applications.

Table 1.1: MIC-3397 Variants

Model number	MIC-3397x*1-M8E	MIC-3397x*2-M8E
Slot Width	Dual Slots (8HP)	Single Slot (4HP)
2nd Layer XTM	Yes	No
Storage	CFsat/SATA HDD	CFast/SATA HDD

* x = A/B/C

- A means CPU is "Pentium® B925C",15W
- B means CPU is "Xeon® E3-1105C v2", 25W
- C means CPU is "Xeon® E3-1125C v2",40W

Table 1.2: MIC-3397 Configurations

	Front Panel							On board header/socket/connector					
	LAN (1)	COM (RJ45)(2)	USB	VGA	DVI	DP	CPU	Memory (Up to 8G) (3)	SO-DIMM (Up to 8G)(4)	SATA HDD Socket	Cfast Socket	Slot Width	Conn.
MIC-3397A2-M8E	2	1	3	1	NA	NA	Pentium B925C	8 GB	NA	1	1	1	J3/J5
MIC-3397C2-M8E	2	1	3	1	NA	NA	Xeon E3-1125C v2	8 GB	1	1	1	1	J3/J5
MIC-3397B1-M8E	2	1	3	1	2	2	Xeon E3-1105C v2	8 GB	1	1	1	2	J3/J5
MIC-3397C1-M8E	2	1	3	1	2	2	Xeon E3-1125C v2	8 GB	1	1	1	2	J3/J5

Note!

1. *LAN2 on front is switchable with RIO LAN1 which can be set in BIOS.*
2. *COM supports RS232/422 mode only.*
3. *Total memory capacity is up to 16GB, 8GB on board, 8GB on SO-DIMM.*
4. *Pentium® B925C SKU w/o SO-DIMM socket*

1.2 Specifications

1.2.1 CompactPCI Bus Interface

The MIC-3397 is compliant with PICMG 2.0 Rev. 3.0. It supports a 64-bit / 33 MHz and 64-bit / 66 MHz PCI bus for up to 8 CompactPCI slots at 3.3 V or 5 V VIO. The MIC-3397 is hot-swap compliant (PICMG 2.1) and conforms to the CompactPCI Packet Switching Backplane specification (PICMG 2.16).

The board can be configured as a system master or a drone board. In drone mode it only draws power from the CompactPCI backplane and is not active on the Compact-PCI bus. However, PICMG 2.16 is still fully supported in this mode.

1.2.2 CPU

The MIC-3397 supports the 22nm technology Quad-Core Intel® Xeon® E3-1125C v2/ E3-1105C v2 and Dual-Core Intel® Pentium® B925C processors with clock frequencies up to 2.5GHz.Supported processors are listed in the table below. The forced airflow cooling is required.

Intel CPU Model NO.	Cores	Freq.	CPU Architecture	DMI	Package	Cache	CPU TDP	Max Power Consumption (Dual slots)	Required airflow
B925C	2	2.0 GHz	(22nm)	1.0x4	FCBGA1284	4MB L3 Cache	15W	90W	20CFM
E3-1105C v2	4	1.8 GHz	(22nm)	1.0x4	FCBGA1284	8MB L3 Cache	25W	100W	20CFM

E3-1125C v2	4	2.5 GHz	(22nm)	1.0x4	FCBGA1284	8MB L3 Cache	40W	115W	30CFM

1.2.3 BIOS

Dual 8M-Byte SPI flash contains a board-specific BIOS (from AMI) designed to meet industrial and embedded system requirements.

1.2.4 Chipset

The Intel® Mobile PCH DH8900 chipset provides excellent flexibility for developers of embedded applications by offering up to 5 GT/s for fast access to peripheral devices.

It delivers outstanding system performance through high bandwidth interfaces such as PCI Express, Serial ATA and USB 2.0.

1.2.5 Memory

The MIC-3397 has up to 8 GB of onboard DDR3 memory and one 204-pin unbuffered DDR3 SO-DIMM sockets up to 8GB memory with ECC support. The following table shows a list of SO-DIMM modules that have been tested on the MIC-3397.

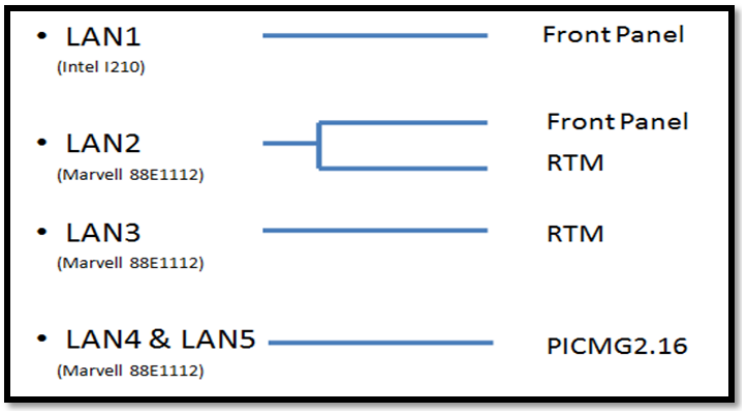
Brand	Size	Speed	Vendor PN	ECC	Pin Count	Memory Chip
ATP	2GB	DDR3-1600	AW56M7218BKK0M	Yes	204 pin	Micron 512M x 8 1-rank
ATP	4GB	DDR3-1600	AW12M7218BLK0M	Yes	204 pin	Micron 512M x 8 1-rank
ATP	8GB	DDR3-1600	AW24M7228BLK0S	Yes	204 pin	Samsung1024M x 8 2-ranks
Memphis	8GB	DDR3-1600	D3SO1G726G-A58IA	Yes	204 pin	Memphis MEM4G08D3EABG-125 512Mx8 DDR3 2-ranks
Memphis	2GB	DDR3-1333	D3SO256M723G-D28MTK	Yes	204 pin	Micron MT41K256M8DA-125:K 256Mx8 DDR3 1-rank
Memphis	4GB	DDR3-1600	D3SO512M726G-D58IA	Yes	204 pin	Memphis MEM4G08D3EABG-125 512Mx8 DDR3 1-rank
Memphis	8GB	DDR3-1600	D3SO1G726GI-A58IA	Yes	204 pin	Memphis MEM4G08D3EABG-125I 512Mx8 DDR3 2-ranks
Transcend	2GB	DDR3-1333	SQR-SD3T-2G1333SED	Yes	204 pin	Samsung 256M x 8 1-rank
Transcend	4GB	DDR3-1333	SQR-SD3T-4G1333SED	Yes	204 pin	Samsung 256M x 8 2-ranks
Transcend	8GB	DDR3-1333/1600	TS1GSK72V6H	Yes	204 pin	Samsung 512Mx8 2-ranks

1.2.6 Ethernet

The MIC-3397 uses one Intel® I210AT GbE Controller to provide 10/100/1000 Mbps Ethernet connectivity (LAN1) and four Marvell 88E1112 LAN PHY chips with integrated LAN MAC in PCH DH8900 to provide 10/100/1000 Mbps Ethernet connectivity (LAN2 ~ LAN5) via rear I/O. Optional settings for the source of each individual Gigabit Ethernet port can be selected in the BIOS menu. These are mutually exclusive and can be any one of:

- Front I/O (RJ-45)
- Rear I/O (Rear Transition Module)
- PICMG 2.16

User can access LAN1 via front panel. LAN2 is accessible via front panel & rear I/O, LAN 3 via rear I/O, LAN4 & LAN5 can be connected to PICMG 2.16 on backplane.



1.2.7 Storage Interface

The MIC-3397 supports four SATA II interfaces. The SATA1 interface can be routed to an on board 2.5" SATA hard disk drive or one 8G on board NAND flash by switch; the SATA 2 interface is routed to an on board Cfast module; SATA 3 & 4 are reserved to rear I/O via J3 connector for user customization.

1.2.8 Serial Interface

Two serial ports are from Super IO and one from PCH. One RJ-45 COM1 port (RS-232/422 interface) is provided on the front panel. Two COM ports (RS-232/422/485 interface) are routed to a rear I/O module as RJ45 or DB9 port via the J5 connector.

1.2.9 USB Port

Six USB 2.0 compliant ports are provided. Three ports are routed to front panel connectors; three ports are routed to rear I/O through the J5 connector.

1.2.10 LEDs

Four LEDs are provided on the front panel as follows:

Table 1.3: LED Indicator for the MIC-3397

Function	Color	Indicator
Hot Swap Status	Blue	The board can be safely removed from system
HDD Status	Yellow	HDD is activity
Power Status	Green	The power is provided to the board.
Master/Drone mode status	Green	LED On-> “Master” mode. LED Off-> “Drone” mode.

1.2.11 Watchdog Timer

An onboard watchdog timer provides system reset capabilities via software control. The programmable time interval is from 1 to 255 seconds.

1.2.12 Optional Rear I/O Modules

The RIO-3317 & RIO-3315 series are the optional RTM (also known as rear I/O module) for the MIC-3397.They offer a wide variety of I/O features, such as two or four RJ45 LAN ports, two COM ports, one VGA ports, two USB2.0 ports, one P/S2 port, or one Mini-SAS port on the certain model. They also come with on-board features such as one USB2.0, two SATA or four SAS (SATA interfaces) on certain models.

Rear I/O modules are available with three different I/O options:

Table 1.4: RIO Configurations

	Rear Panel							On board header/socket/connector						
	LAN *	VGA	PS/2	COM-RJ45	COM-DB9	USB2.0	Mini SAS*	USB2.0	VGA	COM	SATA	SAS* (SATA Interface)	Slot width	Conn.
RIO-3317-B1E	2	1	1	1	1	2	NA	1	NA	NA	2	NA	1	J3/J5
RIO-3317-C1E	4	1	1	1	NA	2	NA	1	NA	1	2	NA	1	J3/J5

Note! *1. 1 x RIO LAN port is switchable with front panel.*

1.2.13 Optional Extension Modules

The MIC-3314 is the optional Extension Module (XTM) on the second layer of MIC-3397 series for dual-slot platform, to increase graphics features as one DVI-D dual link port, one DVI-I single link port and two DP port by an assembled an E6760 added-in card as MXM type A form factor.

Table 1.5: The second layer XTM(8HP) Configurations

XTM Model Number	IO Panel			Added-in Card
	DVI-I single link	DVI-D dual link	DP	E6760 MXM module
MIC-3314-xxx	1	1	2	1

1.2.14 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 55° C (32 ~ 122° F)

Note! *The operating temperature range of the MIC-3397 depends on the installed processor and the airflow through the chassis.For extended temperature products please contact your ADVANTECH representative.*

- **Storage Temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 95% @ 40° C (non-condensing)
- **Humidity (Non-operating):** 95% @ 60° C (non-condensing)
- **Vibration:**
  - 5 ~ 100 Hz, 2.0 Grms with CFast/SSD (without on-board 2.5" SATA HDD) on 4HP SKU

  - 5 ~ 100 Hz, 1.06 Grms with CFast/SSD (without on-board 2.5" SATA HDD) on 8HP SKU
- **Vibration (Non-operating):** 5 ~ 500 Hz, 2 Grms
- **Shock:** 10 G (without on-board 2.5” SATA HDD), 11 ms
- **Shock (Non-operating):** 30 G, 11ms (On dual slot SKU)
- **Board size:**
  - 6U/1 slot width (4HP): 233.35 x 160 x 20 mm (9.2" x 6.3" x 0.8")
  - 6U/2 slot width (8HP): 233.35 x 160 x 40 mm (9.2" x 6.3" x 1.6")
- **Weight:**
  - 6U/1 slot width (4HP): 0.83 kg (Bare board)
  - 6U/2 slot width (8HP): 1.35 kg (Bare board)

1.2.15 CompactPCI Mechanical Design

MIC-3397 series is assembled with a copper heatsink for CPU & MXM, with aluminum heatsink for PCH. However, forced air cooling in the chassis is still needed for operational stability and reliability.

1.2.16 CompactPCI Bridge

The MIC-3397 uses a Pericom PI7C9X130D universal bridge as a gateway to an intelligent subsystem. When configured as a system controller, the bridge acts as a standard transparent PCI Express to PCI/PCI-X Bridge. As a peripheral controller it allows the local MIC-3397 processor to configure and control the onboard local subsystem independently from the CompactPCI bus host processor. The MIC-3397 local PCI subsystem is presented to the CompactPCI bus host as a single CompactPCI device. When the MIC-3397 is in drone mode, the Pericom PI7C9X130D is electrically isolated from the CompactPCI bus. The MIC-3397 receives power from the backplane, supports rear I/O.

The Pericom PI7C9X130D PCI bridge offers the following features:

- PCI Interface:
  - Full compliance with the PCI Local Bus Specification, Revision 3.0
  - Supports 3.3V PCI signaling with 5V I/O tolerance
- Supports transparent mode of operations.
- Supports forward bridging
- 64-bit, 66MHz asynchronous operation
- Provides two level arbitration support for 7 PCI Bus masters
- 16-bit address decode for VGA
- Usable in CompactPCI system slot

Please consult the Pericom PI7C9X130D data book for details.

1.2.17 I/O Connectivity

For MIC-3397, the front panel I/O is provided by two RJ-45 Gigabit Ethernet ports, one RJ-45 COM port, three USB 2.0 ports, one VGA port. Its onboard I/O consists of two SATA channels, one is connected to a daughter board for 2.5" SATA HDD or NAND flash and the other is connected to a CFast slot. Rear I/O connectivity is available via the following CompactPCI connectors:

- J3: two Gigabit Ethernet links to the backplane for PICMG 2.16 packet switch, two SATA port, PCIe Gen3 x4 on the RTM.
- J5: Two Gigabit Ethernet LAN ports, two COM ports, three USB ports, one PS/2 port (for keyboard/mouse) and one VGA port on the RTM.

1.2.18 XTM Connectors (Extension Module)

MIC-3397 is extended by a XTM carrier board with one AMD E6760 MXM module via PCI Express gen2 x8 bus.

1.2.19 Hardware Monitor

One Hardware Monitors (NCT6776D) is available to monitor critical hardware parameters. It is to monitor CPU temperature and core voltage information.

1.2.20 Super I/O

The MIC-3397 Super I/O device provides the following legacy PC devices:

- Serial port COM1 and COM2 are connected to the rear panel.
- The PS2 (keyboard/mouse) is routed to the rear I/O module.

1.2.21 RTC and Battery

The RTC module keeps the system date and time by connecting a CR2032 (3 V, 210 mAH) battery.

1.3 Functional Block Diagram

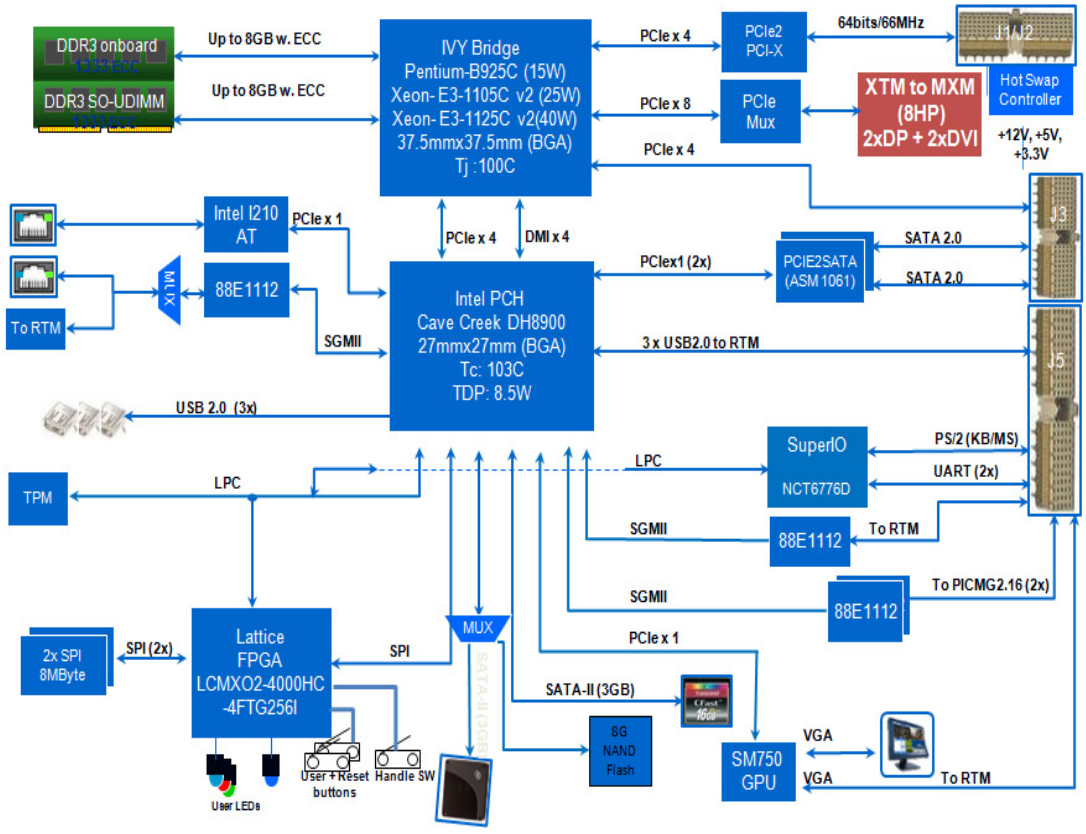


Figure 1.1 MIC-3397 functional block diagram

1.4 Jumpers and Switches

Table 1.4 and Table 1.5 list the jumper and switch functions. Read this section carefully before changing the jumper and switch settings on your MIC-3397 board.

Figure 1.2 illustrates the jumper and switch locations.

The MIC-3397 provides a system reset button on the front panel, it resets all payload and application-related circuitry.

Table 1.6: MIC-3397 Jumper /Button & Switch Descriptions

Number	Function
JP2	Clear CMOS
SW4	System Reset Button
CN3	Chandler Switch

Table 1.7: MIC-3397 Switch Descriptions

Number	Function
SW1-1	Drone mode off (Default)/Drone mode on
SW1-2	XTM (Default)/XMC
SW2-1	+5v/+3.3v supply (Default)/ +5v only supply
SW2-2	SATA (Default)/NAND flash
SW3-1	Front LAN (Default)/Rear LAN

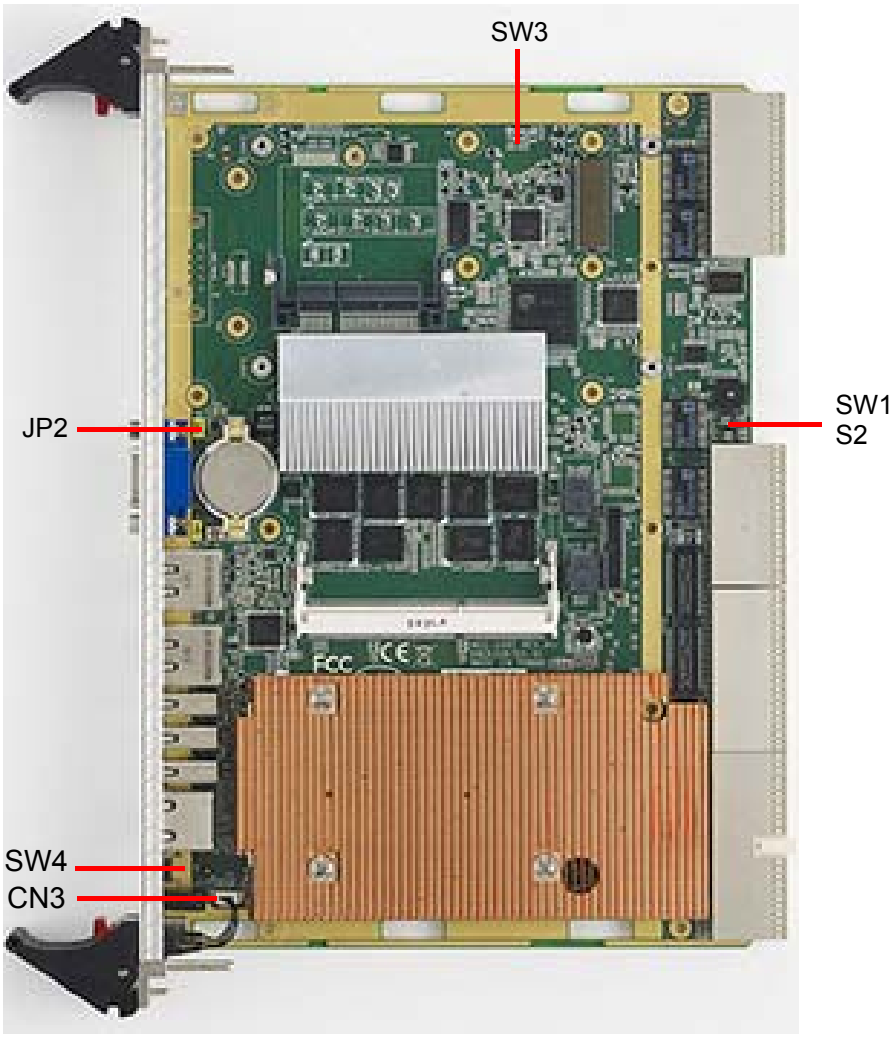


Figure 1.2 MIC-3397 Jumper Locations

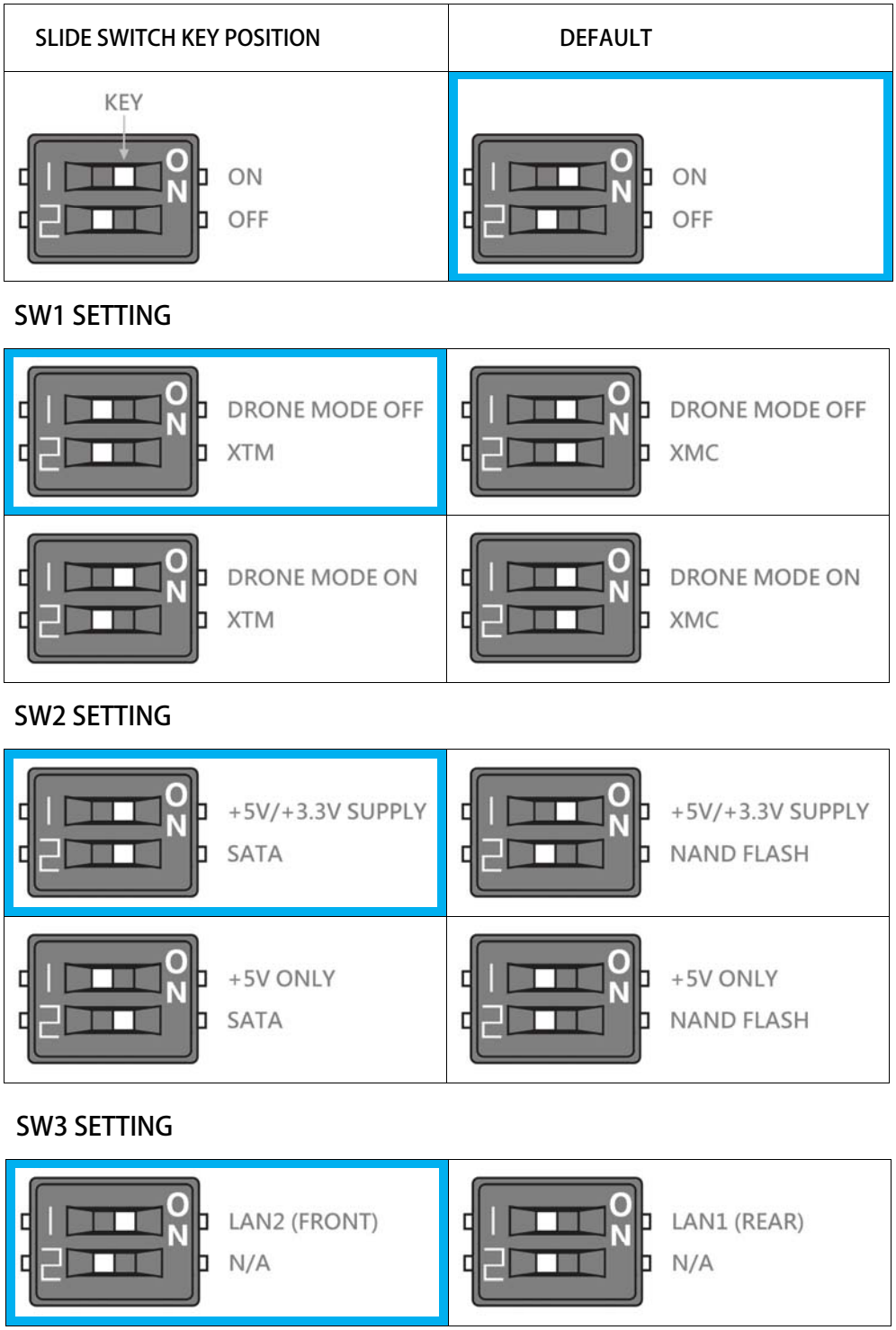


Figure 1.3 MIC-3397 Jumper Locations

1.4.1 Clear CMOS (JP2)[m7]

This jumper is used to erase CMOS data. MIC-3397 Clear CMOS will erase user password and system time information only, since we have implemented a CMOS backup mechanism. Likewise, if battery power is lost, CMOS forgets only system time and password.

1.5 Connector Definitions

Tables 1.8 and 1.9 list the function of each connector of MIC-3397 and its RIO-3317, Figures 1.4 and 1.5 illustrate connector locations.

Table 1.8: MIC-3397 Connector Descriptions

Number	Function
J1/J2	Primary CompactPCI bus
J3/J5	Rear I/O transition
XTM1	XTM connector on XTM
BIOS1,BIOS2	BIOS Socket
CN5	SO-DIMM Socket
MCMC1	FPGA programming connector
CFAST1	Cfast connector
CNXTM1	XTM connector on 4HP
SATA1	SATA2.0 on board connector

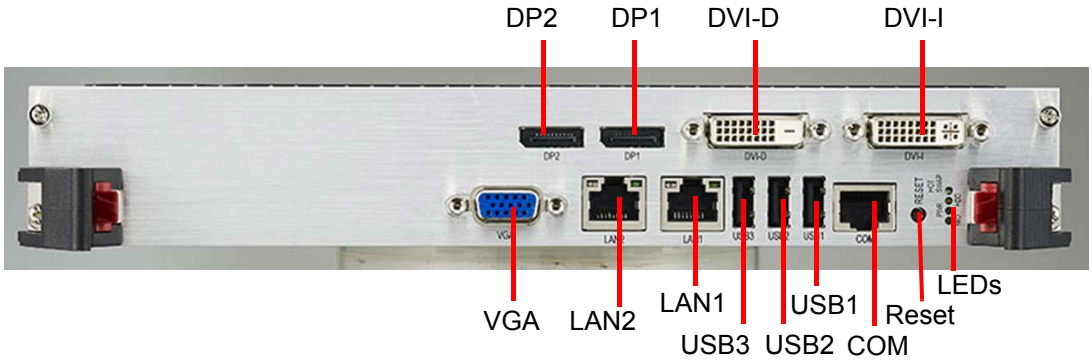


Figure 1.4 MIC-3397 8HP Front Panel Ports, Indicators and Buttons

Figure 1.5 MIC-3397 4HP Front Panel Ports, Indicators and Buttons

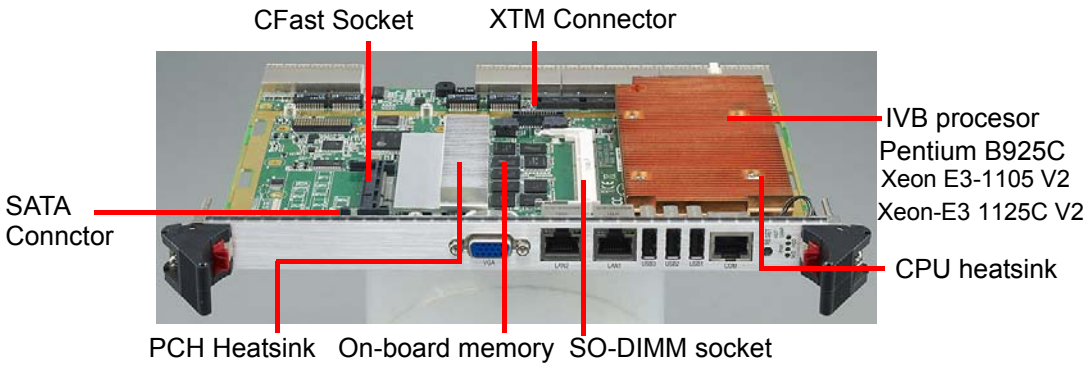


Figure 1.6 MIC-3397 4HP with On-board Features

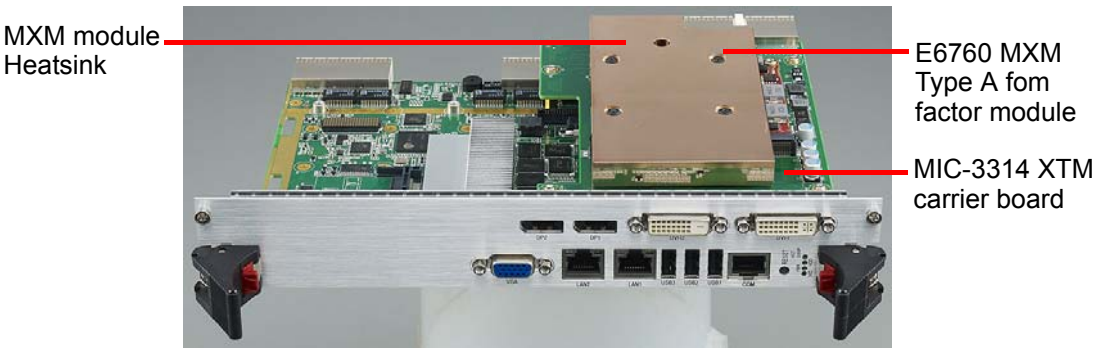


Figure 1.7 MIC-3397 8HP with Features

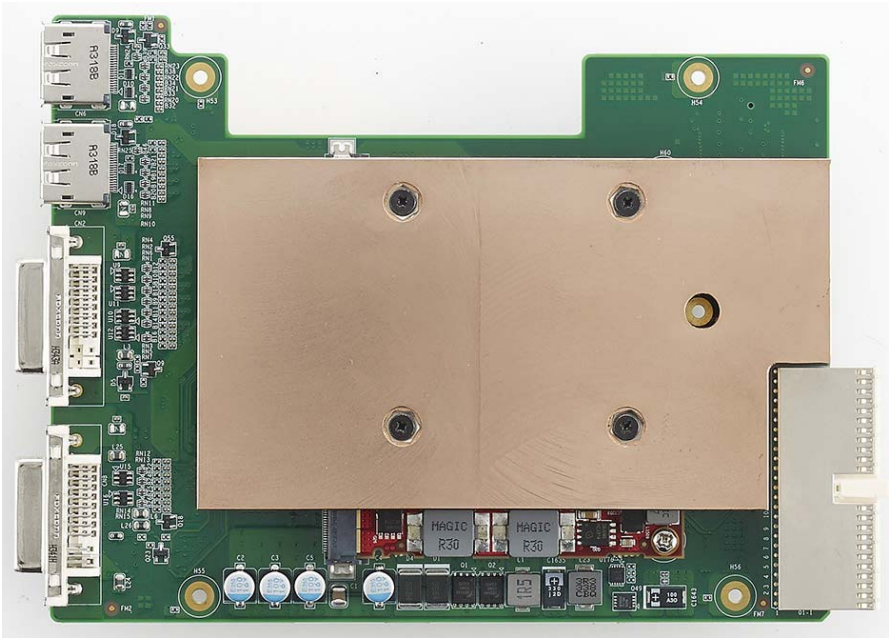


Figure 1.8 MIC-3314 XTM Carrier Board View

Table 1.9: RIO-3317 Connector Descriptions

	Number	Function
RIO-3317-B1E	RJ3/RJ5	Rear I/O transition
	CN3	USB2.0 pin header
	CN9/CN10	SATA2.0 on board connector
RIO-3317-C1E	RJ3/RJ5	Rear I/O transition
	CN3	USB2.0 pin header
	CN9/CN10	SATA2.0 on board connector
	CN21	DB9 COM pin header

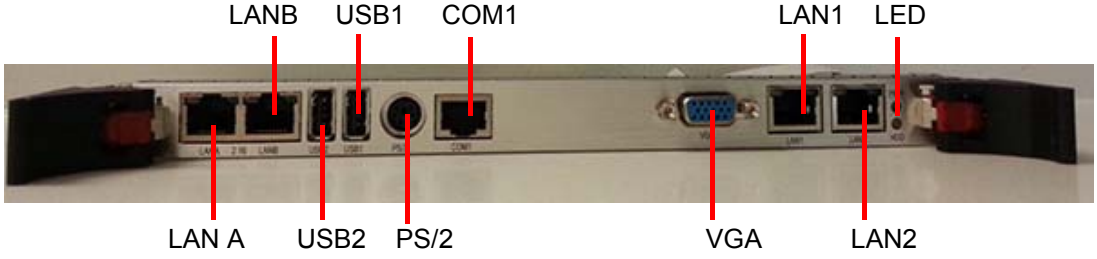


Figure 1.9 RIO-3317C1E Front Panel Ports and Indicators

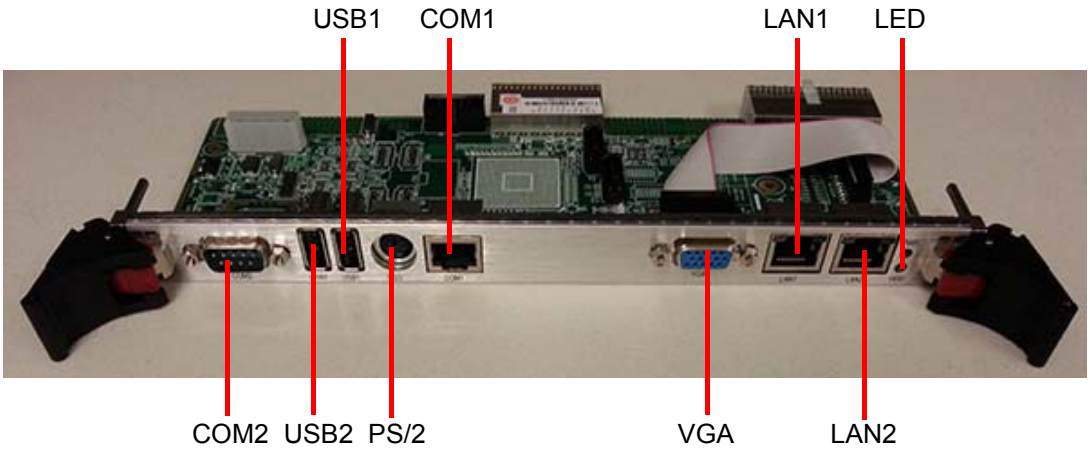


Figure 1.10 RIO-3317-B1E Front Panel Ports and Indicators

1.5.1 USB Connectors

The MIC-3397 provides up to six USB2.0 channels. Three USB ports are on the front panel. Three USBs are routed to rear I/O via the J5 connector–two on the RIO panel, the other via on-board connector. The USB interface provides complete plug and play, hot attach/detach for up to 127 external devices. The MIC-3397 USB interface complies with USB specification R2.0 and is fuse protected (5 V @ 1.1 A).The USB interface can be disabled in the system BIOS setup. The USB controller default is set to “Enabled”.

1.5.2 Serial Ports

The MIC-3397 provides three serial port channels, one is routed to MIC-3397 front panel with RS-232 interface default via RJ-45 connector, but it also supports RS422, which can be selected in BIOS set-up menu. Another two channels are routed to rear I/O with RS232/422/485 support via RJ-45 or DB9 connector and pin header in certain rear I/O modules. Please refer to connector list for details.

1.5.3 Ethernet Configuration

The MIC-3397 provides five LAN ports, one is equipped with Intel® LAN controller I210AT, PCI-Express gen1 based, which provides full compliance with IEEE802.3 10/100/1000 Base-TX Ethernet interfaces; another four are from PCH DH8900 built-in PHY chip, combined with Marvell 88E1112 MAC chip, which also provide four 10/100/1000Base-TX Ethernet interfaces. LAN2 is switchable with rear I/O LAN port. The MIC-3397 also supports the PICMG 2.16 Packet Switching Backplane Specification via the J3 connector.

1.5.4 SATA Interface

The MIC-3397 provides four SATA2.0 channels; one is routed for SATA connector or 8G on board NAND flash chip, another is for Cfast socket with SATA interface built in DH8900, while the remaining two SATA channels are routed to rear I/O by PCIe to SATA controller ASM1061 chip with SATA2.0 fixed.

1.5.5 System Reset Button

The MIC-3397 provides a system reset button located on the front panel. The system reset button resets all payload and application-related circuitry.

1.5.6 XTM Carrier Board (MIC-3314)

The MIC-3397 is configured with single and dual slot board widths; the second layer XTM carrier board is MIC-3314, assembled with AMD Radeon E6760 MXM type A form factor module and its heatsink. It provides up to four display outputs, two DP ports, one single link DVI-I port and one dual link DVI-D port, with multi-display support, up to four display outputs simultaneously. Its high resolution parameter is usually used in image processing applications, with another two VGA ports from 4HP front panel and rear I/O panel, which are able to provide up to six display outputs at the same time by extended desktop.

1.5.7 Multi-Display Configuration

There are a total of six display outputs from MIC-3397 dual slots SKU, with SM750 GPU on 4HP and E6760 MXM type A graphic module on the second layer. Two VGA from SM750, one DVI-D, one DVI-I and two DP from E6760.

Use SM750 or E6760 as main display, which can be configured as follows:

Controller on 4HP SM750	SM750GX160000-AC 265P, 16Mbytes of embedded 32-bit DDR memory
Resolution	Dual display: 1360x768 (Clone & extended mode)
	Single display:1920x1080 (16bit, single mode only)
Controller on MIC-3314	AMD Radeon E6760, 128-bit wide, 1 GB, GDDR5, 51.2 GB/s
Resolution	DP: 4096 x 2160 Dual Link DVI-D: 2560 x 1600 Single Link DVI-I: 1920 x 1200
Multi-display	Max up to 6 multi-displays: (Clone mode/extended) 2xDP+1xDVI-D+1xDVI-I+2xVGA

Configuration A: six simultaneous outputs. One main display + five extended displays based on resolution 1360x768.

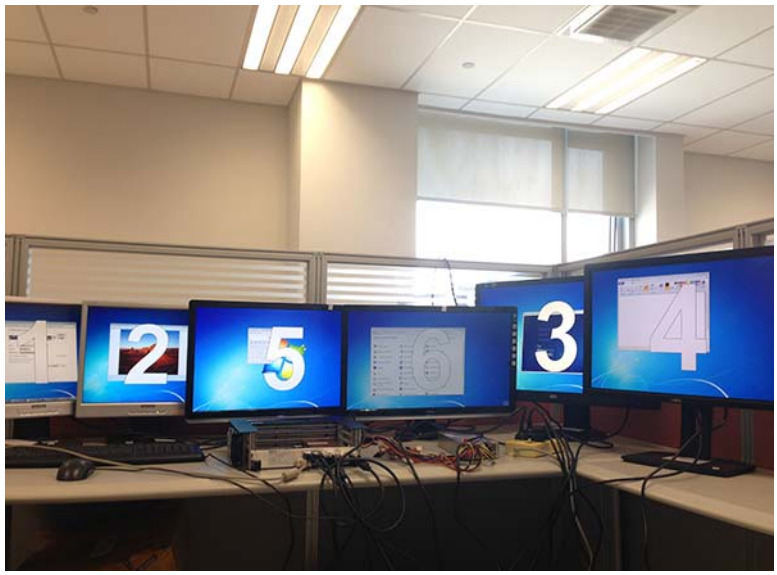


Figure 1.11 MIC-3397 Six Multi-display configuration

Configuration B: When a higher resolution is needed, due to SM750 HW limitation, only one VGA output is provided, for a total of five simultaneous outputs. One main display + four extended displays based on resolution 1920x1080 (16 bit).

Figure 1.12 MIC-3397 Five Multi-display configuration

How to set up 1920x1080 resolution in resolution setting:

1. Click "Advanced Setting" and enter "Monitor" sub-menu; make sure "Hide modes that this monitor cannot display" is not checked. Set color as "High color (16 bit)".
2. Choose "Adapter" sub-menu, and "List All Modes". Select "1920 by 1080, high color (16 bit), 60 Hertz".

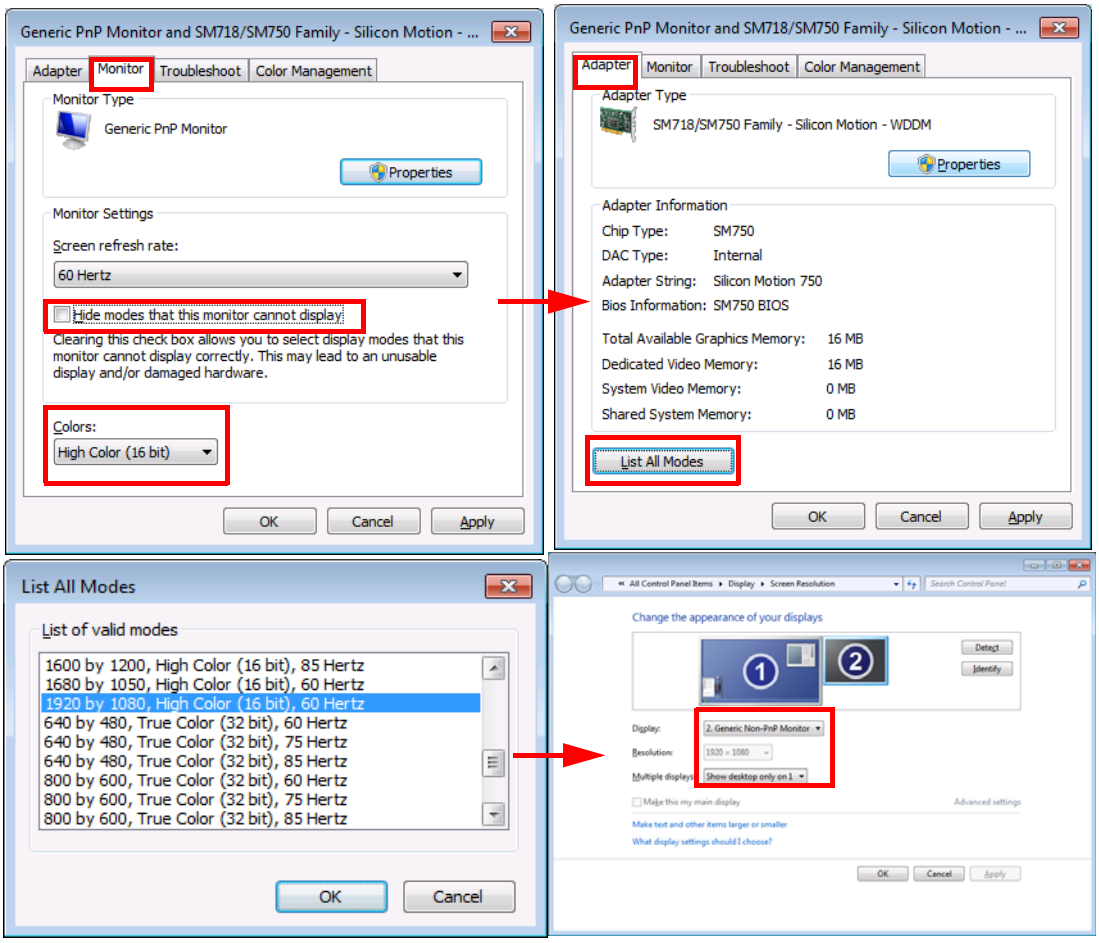

Generic PnP Monitor and SM718/SM750 Family - Silicon Motion - ...
Adapter
Monitor
Troubleshoot
Color Management
Monitor Type
Generic PnP Monitor
Properties
Monitor Settings
Screen refresh rate:
60 Hertz
Hide modes that this monitor cannot display
Clearing this check box allows you to select display modes that this monitor cannot display correctly. This may lead to an unusable display and/or damaged hardware.
Colors:
High Color (16 bit)
OK
Cancel
Apply
Adapter Type
SM718/SM750 Family - Silicon Motion - WDDM
Adapter Information
Chip Type: SM750
DAC Type: Internal
Adapter String: Silicon Motion 750
Bios Information: SM750 BIOS
Total Available Graphics Memory: 16 MB
Dedicated Video Memory: 16 MB
System Video Memory: 0 MB
Shared System Memory: 0 MB
List All Modes
List All Modes
List of valid modes
1600 by 1200, High Color (16 bit), 85 Hertz
1680 by 1050, High Color (16 bit), 60 Hertz
1920 by 1080, High Color (16 bit), 60 Hertz
640 by 480, True Color (32 bit), 60 Hertz
640 by 480, True Color (32 bit), 75 Hertz
640 by 480, True Color (32 bit), 85 Hertz
800 by 600, True Color (32 bit), 60 Hertz
800 by 600, True Color (32 bit), 75 Hertz
800 by 600, True Color (32 bit), 85 Hertz
Change the appearance of your displays
Detect
Identify
Display:
Resolution:
Multiple displays:

Figure 1.13 1920 by 1080 Resolution Setting

1.6 Safety Precautions

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electric shock, always disconnect the power from your CompactPCI chassis before you work on it. Don't touch any components on the CPU board or other boards while the CompactPCI chassis is powered.
- Always ground yourself to remove any static charge before you touch your CPU board. Be particularly careful not to touch the chip connectors.
- Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the board in its antistatic packaging when it is not installed in the chassis, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.7 Installation Steps

The MIC-3397 contains electro-statically sensitive devices. Please discharge your body and clothing before touching the assembly. Do not touch components or connector pins. We recommend that you perform assembly at an anti-static workbench.

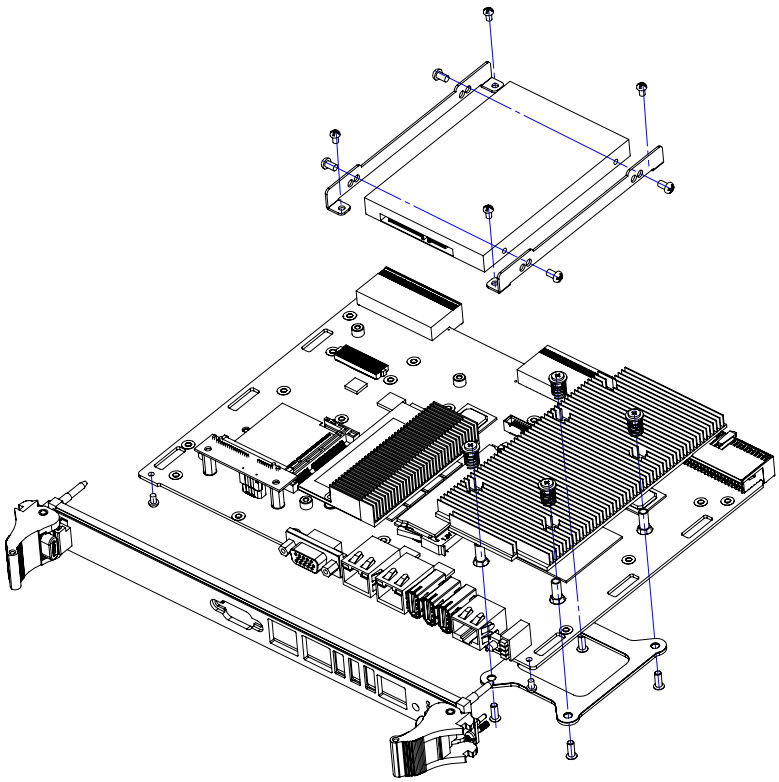


Figure 1.14 Complete Assembly of MIC-3397 Single Slot with SATA HDD

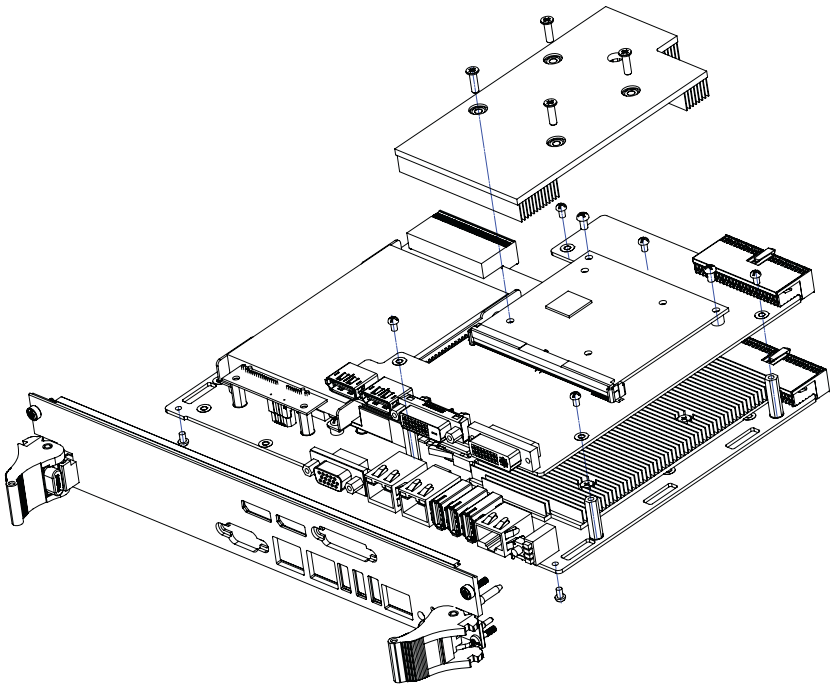


Figure 1.15 Complete Assembly of MIC-3397 Dual Slot with SATA HDD

1.7.1 MIC-3397 HDD Installation Steps

The MIC-3397 supports 2.5” SATA hard disk drive. The following steps illustrate the installation steps.

1. Prepare SATA HDD and 4pcs M2.5 HDD screws.

2. Make sure two HDD brackets and SATA daughter board are assembled already, then insert HDD device into SATA daughter board connector.

3. Fasten 4pcs HDD screws in holes to fix HDD device in place.

1.7.2 MIC-3397 Cfast Installation Steps

The MIC-3397 supports Cfast. The following steps illustrate the installation steps.

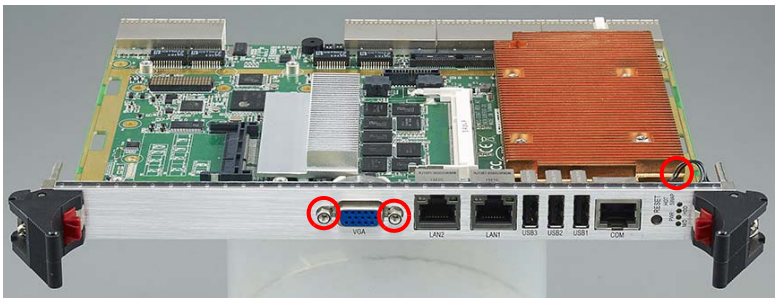
1. Prepare Cfast and 1pc M2.5 screw.

2. Insert Cfast into Cfast socket, then fasten with screw as below.

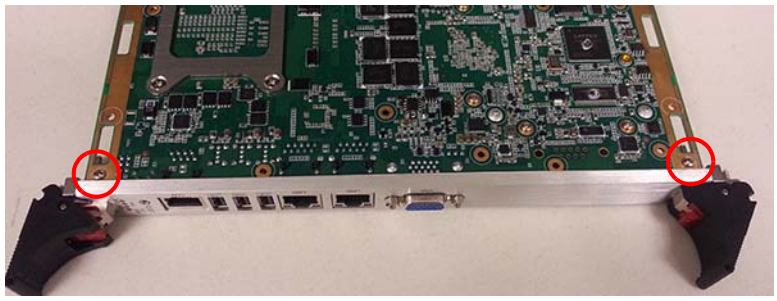
1.7.3 MIC-3397 Upgrade From 4HP to 8HP Installation Steps

The MIC-3397 supports 8HP configuration. The user can buy MIC-3314 assembly board (including XTM carrier board, MXM module, heatsink) to upgrade from 4HP to 8HP; follow installation steps below.

1. Remove hotswap handle switch cable on top side, and uninstall the 2 VGA posts from the front panel.

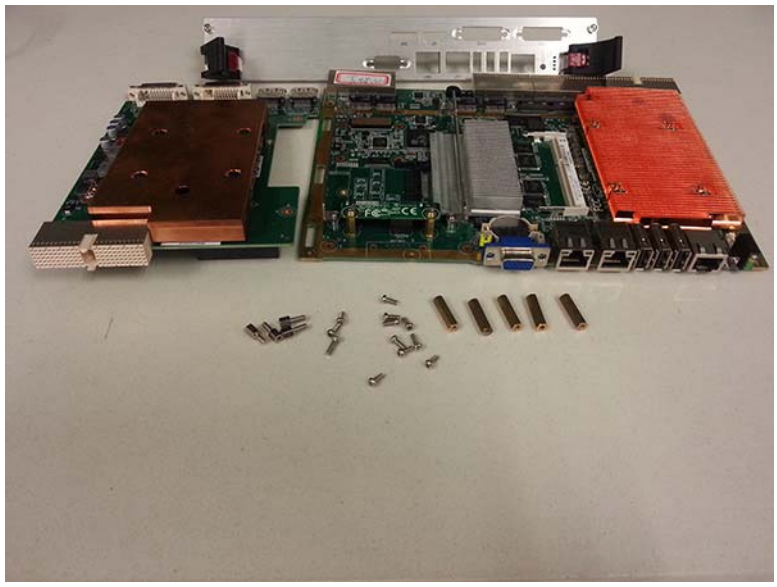


2. Remove two screws on the bottom side.

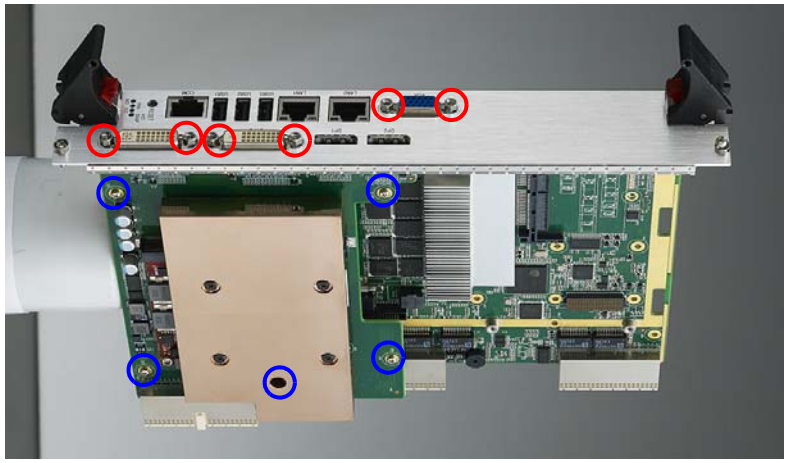


3. Uninstall 4HP board as shown below.

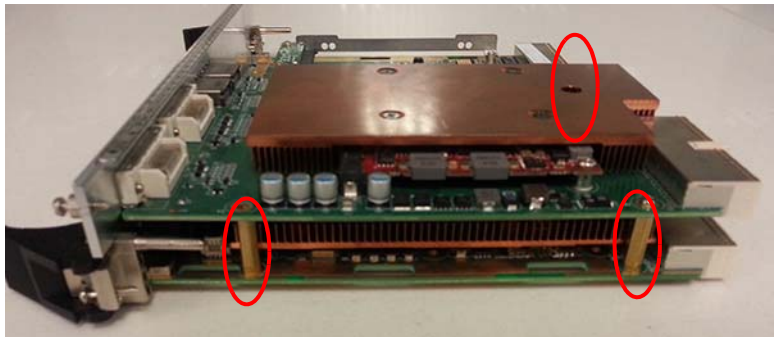
4. Prepare all 8HP required parts, including 4HP board, 8HP front panel, screw, post, MIC-3314 XTM assembly board.



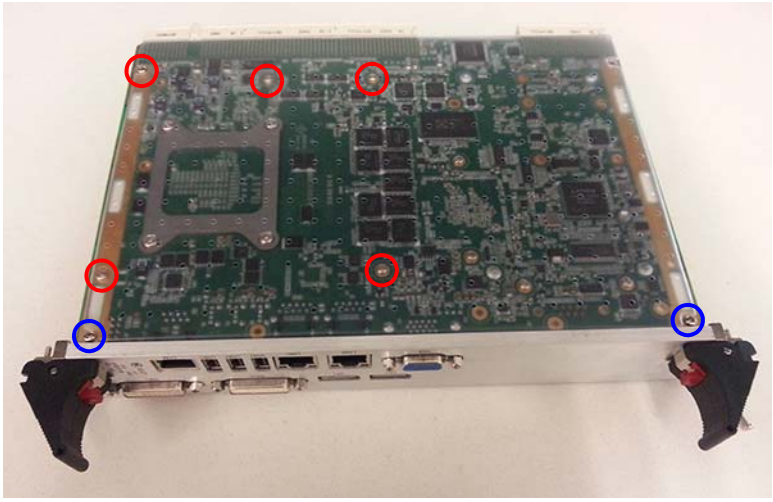
5. Fasten 5 screws, 5 posts and 6 VGA/DVI screws on XTM board top side, and install hot swap switch cable on 4HP board.



6. Install 5 copper posts to assemble 4HP and XTM board.



7. Fasten 5 screws on top side to fix to the copper posts, then 2 screws to fix front panel and side cover on bottom side.



1.8 Software Support

Windows 7, Windows Server 2008, Windows Server 2012, Fedora Linux 16, Red Hat Enterprise Linux 6.1 and Vxworks 6.9 have been tested on the MIC-3397. Please contact your local sales representative for details on support for other operating systems.

Chapter 2

AMI BIOS Setup

This chapter describes how to configure the AMI BIOS.

2.1 Introduction

The AMI BIOS has been customized and integrated into many industrial and embedded motherboards for decades. This section describes the BIOS which has been specifically adapted for the MIC-3397. With the AMI UEFI BIOS Setup Utility, you can modify BIOS settings and control the special features of the MIC-3397. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the MIC-3397 setup screens.

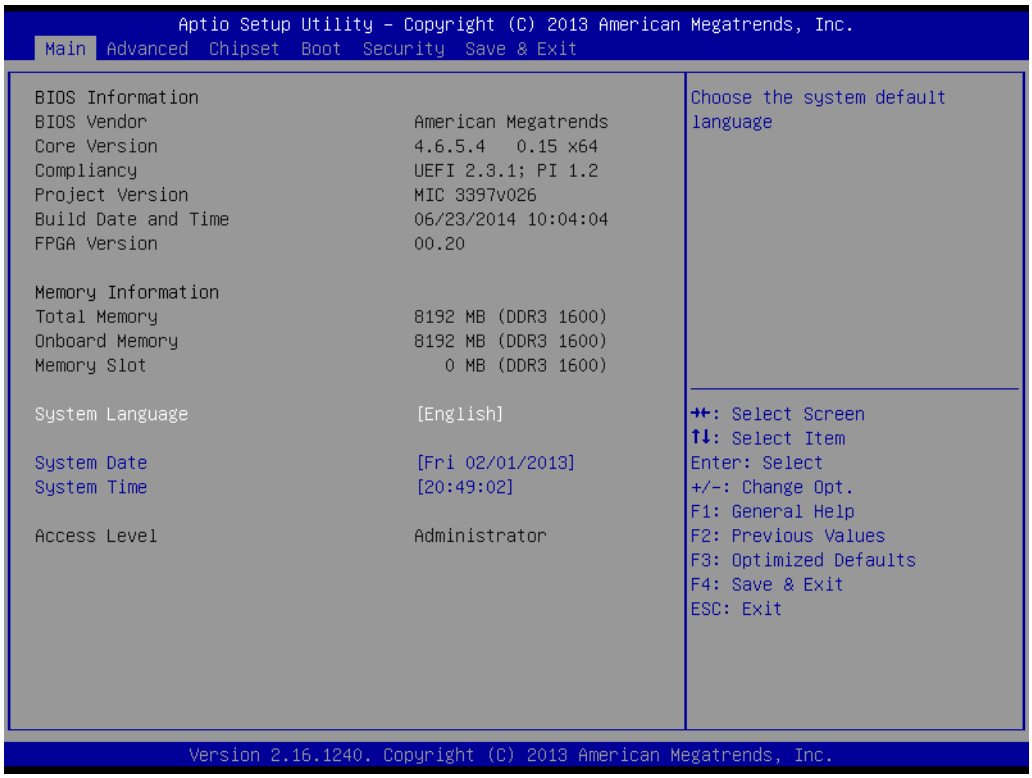

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.4 0.15 x64
Compliancy UEFI 2.3.1; PI 1.2
Project Version MIC 3397v026
Build Date and Time 06/23/2014 10:04:04
FPGA Version 00.20
Memory Information
Total Memory 8192 MB (DDR3 1600)
Onboard Memory 8192 MB (DDR3 1600)
Memory Slot 0 MB (DDR3 1600)
System Language [English]
System Date [Fri 02/01/2013]
System Time [20:49:02]
Access Level Administrator
Choose the system default language
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.1 Setup program initial screen

The BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS so it retains the Setup information when the power is off.

2.2 BIOS Setup

The MIC-3397 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features.

The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard.

When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM. But there is a CMOS backup mechanism in the MIC-3397 to protect the user's personal settings, which allows final BIOS setup information to be retained always except for date/time and user password, which are reset when CMOS battery is removed, or password only erased using the clear jumper.

When the power is turned on, press the <Del> button during the BIOS POST (Power - On Self Test) to access the CMOS SETUP screen.

Control Keys	
< → > < ← >	Select screen
<↑><↓>	Select item
<Enter>	Select
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Previous values
<F3>	Optimized defaults
<F4>	Save and exit

2.3 Entering Setup

Turn on the computer, and there should be a POST (Power-On Self Test) screen that shows the BIOS supporting the CPU, press <DEL> or <F2>, then you will immediately be allowed to enter Setup.

American Megatrends
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.
**** MIC-3397 BIOS v0.34 (08/21/2014) ****
Press <DEL> or <F2> to enter setup.
BIOS Date: 08/21/2014 16:40:31 Ver: 4.6.5.4
CPU: Intel(R) Xeon(R) CPU @ 2.50GHz Speed: 2500MHz
Total Memory: 8192MB (DDR3 1600)
USB Devices total: 1 KBDs, 0 MICE, 0 MASS, 1 HUBs
Detected ATA/ATAPI Devices...
SATA PORT4: SQF-S10S4-16G-ETE, S.M.A.R.T Supported

Figure 2.2 Press <DEL> or <F2> to Run Setup

2.3.1 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. Two main setup options are described in this section. The main BIOS setup screen is shown below.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.4 0.15 x64
Compliancy UEFI 2.3.1; PI 1.2
Project Version MIC 3397v026
Build Date and Time 06/23/2014 10:04:04
FPGA Version 00.20
Memory Information
Total Memory 8192 MB (DDR3 1600)
Onboard Memory 8192 MB (DDR3 1600)
Memory Slot 0 MB (DDR3 1600)
System Language [English]
System Date [Fri 02/01/2013]
System Time [20:49:02]
Access Level Administrator
Choose the system default language
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.3 Main setup screen

The main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured while options in blue can. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System Time/System Date**

  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

2.3.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIC-3397 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

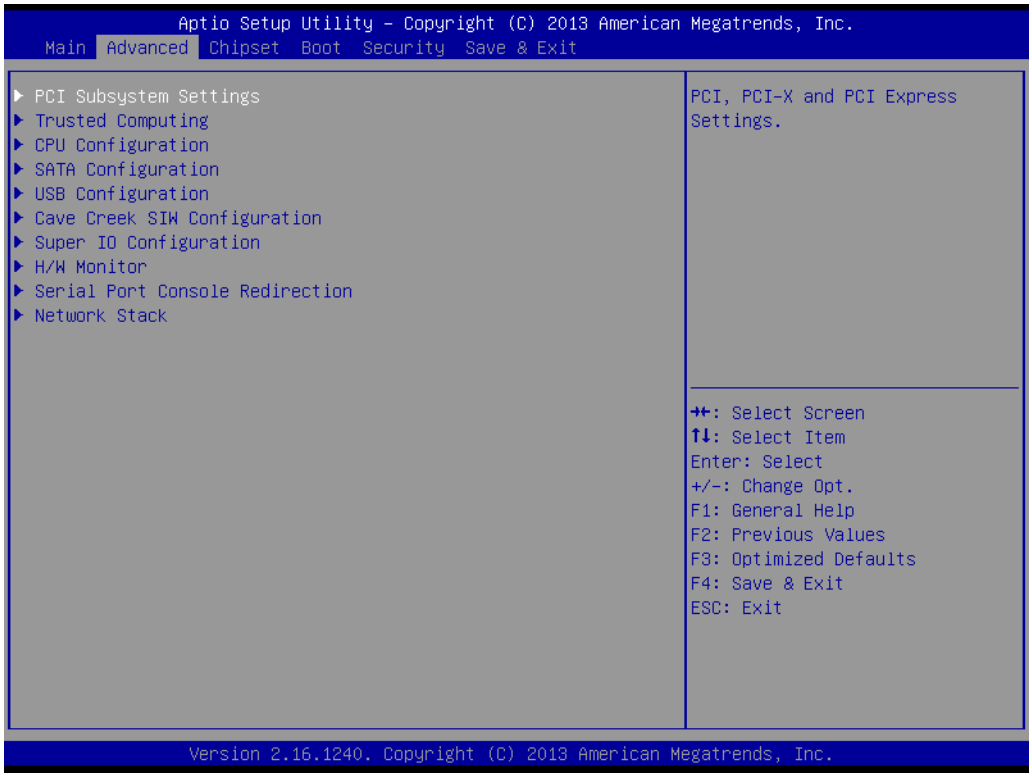
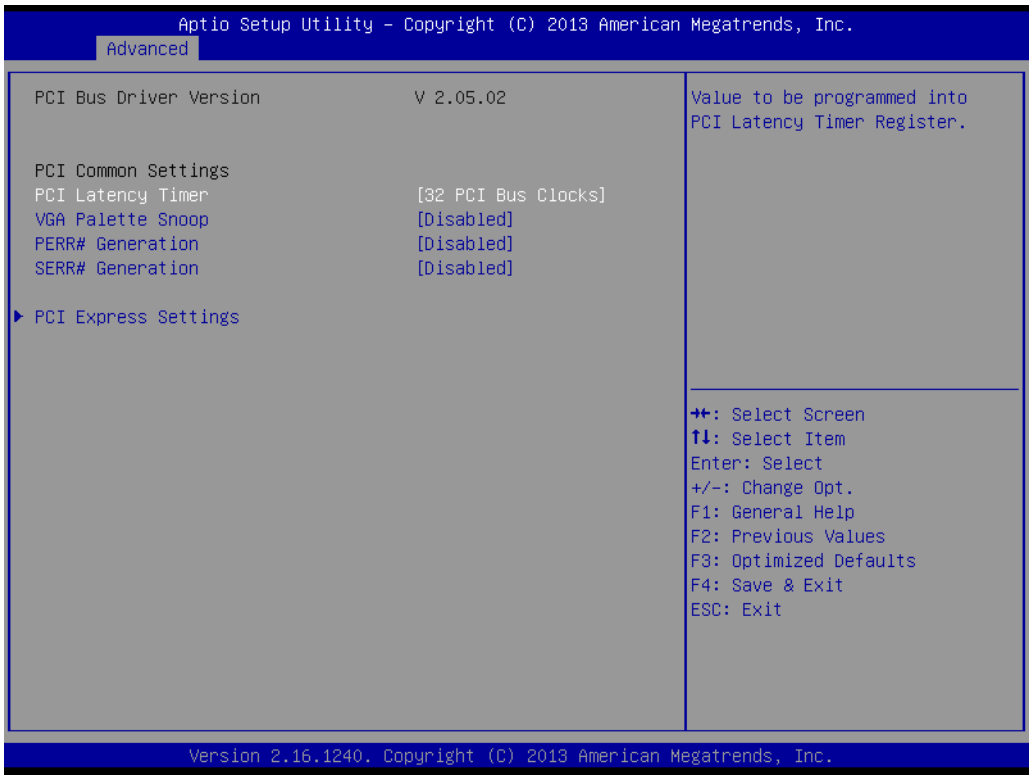
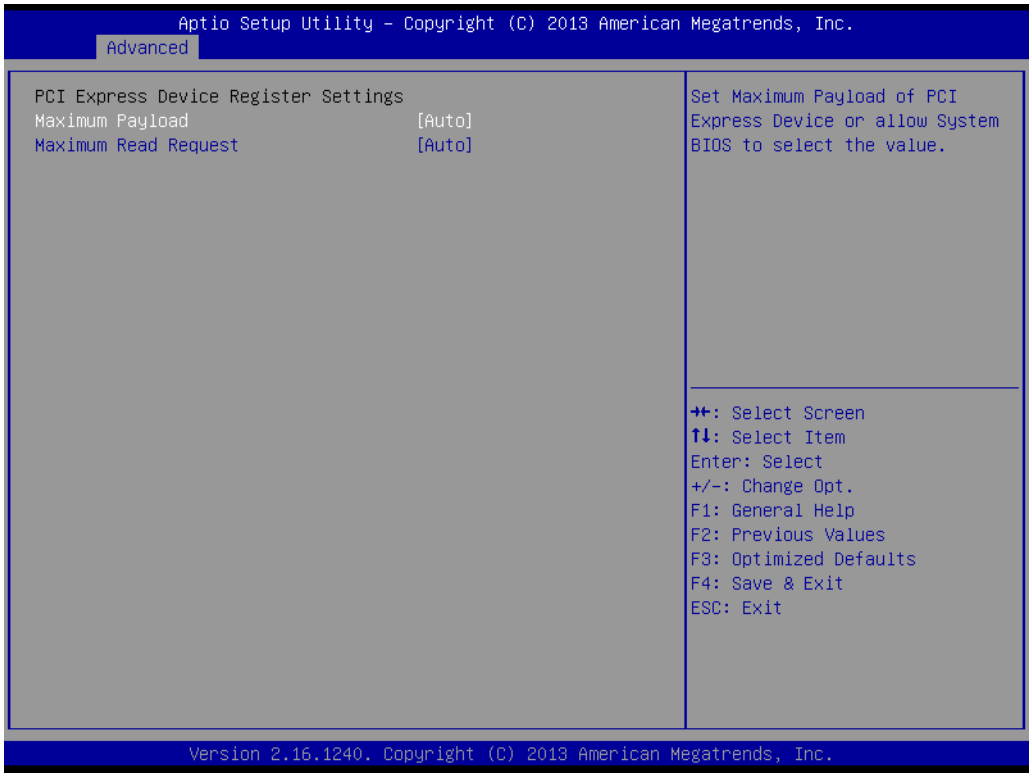


Figure 2.4 Advanced BIOS features setup screen

2.3.2.1 PCI Subsystem Setting


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced
PCI Bus Driver Version V 2.05.02
PCI Common Settings
PCI Latency Timer [32 PCI Bus Clocks]
VGA Palette Snoop [Disabled]
PERR# Generation [Disabled]
SERR# Generation [Disabled]
PCI Express Settings
Value to be programmed into PCI Latency Timer Register.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced
PCI Express Device Register Settings
Maximum Payload [Auto]
Maximum Read Request [Auto]
Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

- **PCI Latency Timer**
  Value to be programmed into PCI Latency Timer Register.
- **PCI Express Settings**
  Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

2.3.2.2 Trusted Computing

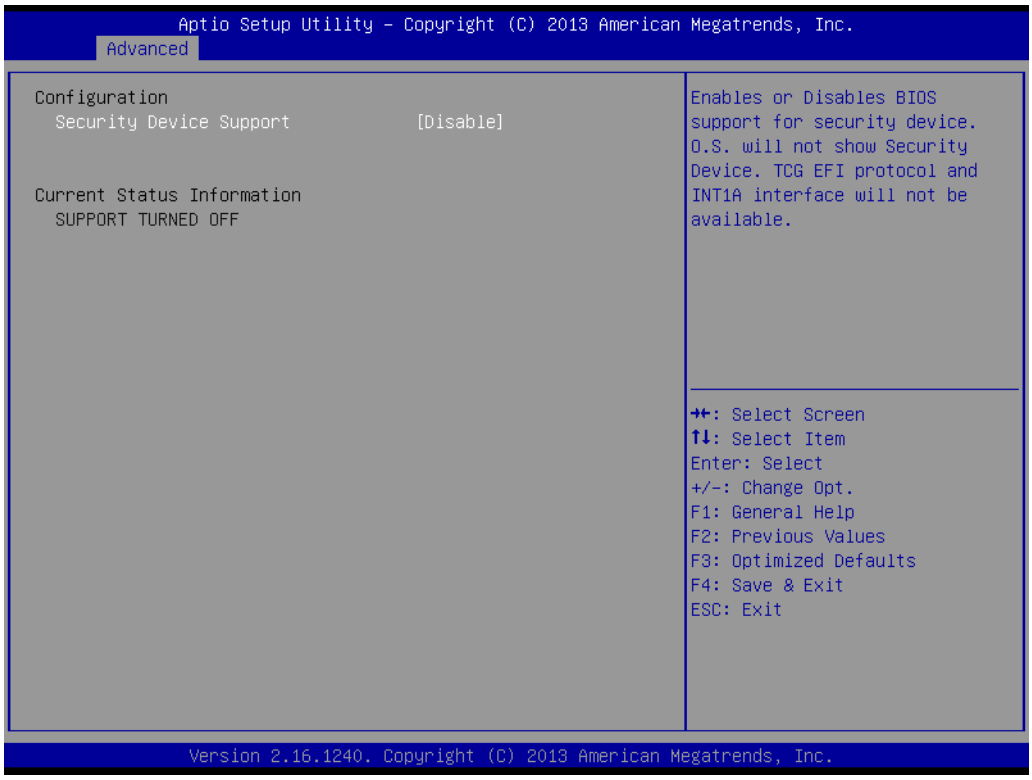
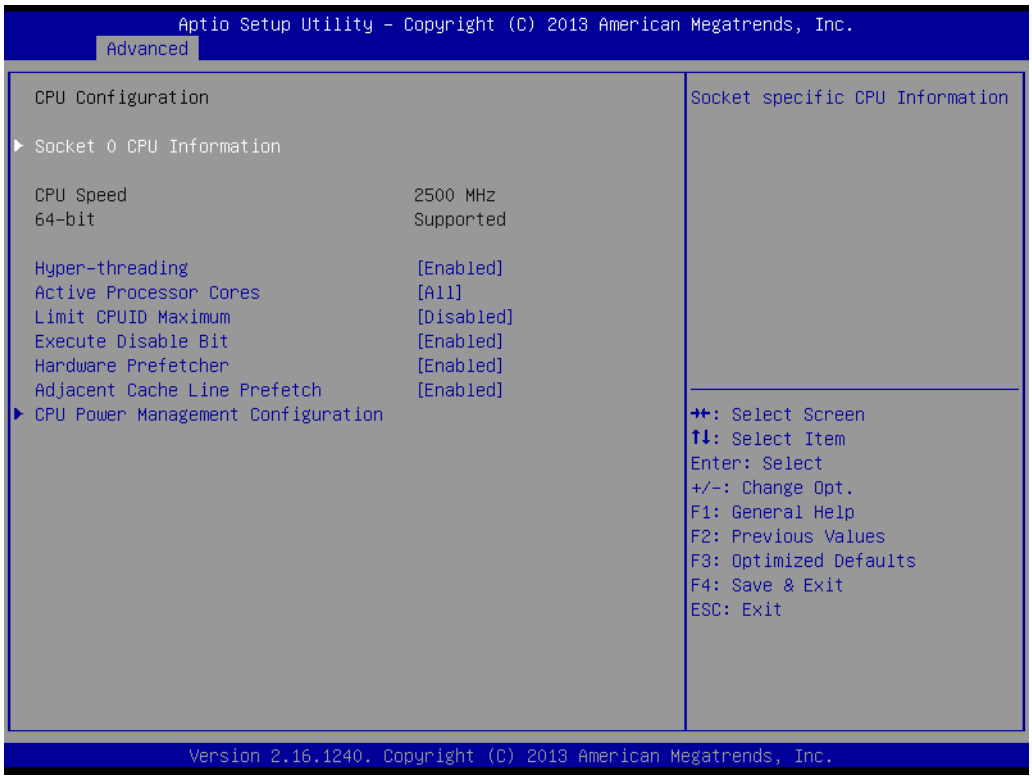

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced
Configuration
Security Device Support [Disable]
Current Status Information
SUPPORT TURNED OFF
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.5 Trusted Computing

- **Security Device Support**
  Disables BIOS support for security device. O.S. will not show Security Device.

2.3.2.3 CPU Configuration



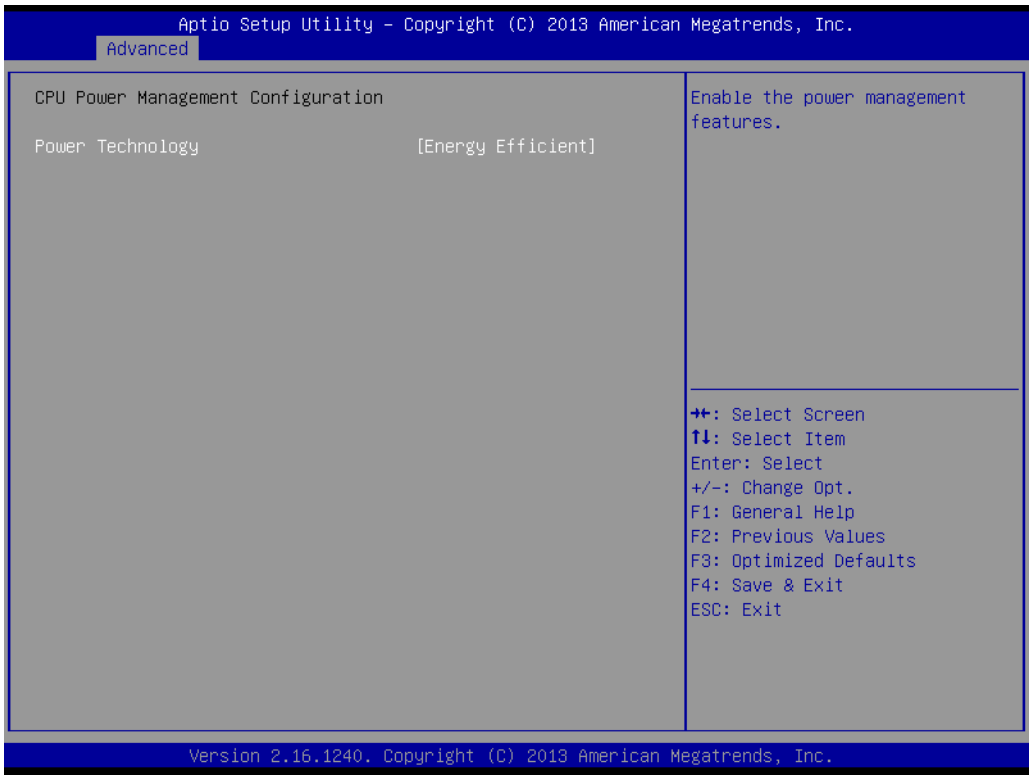


Figure 2.6 CPU configuration

- **Hyper-Threading**

  This item allows you to enable or disable Intel® Hyper Threading technology. The default setting is “Enabled”.

- **Active Processor Cores**

  This item allows you to configure the Processor Cores quantity from “1” to “All”. The default setting for this item is “All”.

- **Limit CPUID Maximum**

  This item allows you to enable or disable Limit CPUID Maximum. The default setting is “Disabled”.

- **Execute Disable Bit**

  This item allows you to enable or disable the No-Execution page protection technology. The default setting for this item is “Enabled”.

- **Hardware Prefetcher**

  This item allows CPU to prefetch the instruction and data from memory to L2 Cache before CPU processing it. This will help system working more efficiently. The default setting for this item is “Enabled”.

- **Adjacent Cache Line Prefetcher**

  It allows users to enable or disable the adjacent cache lines prefetcher feature.

- **CPU Power Management Configuration**

  It allows users to adjust CPU power related parameters.

2.3.2.4 SATA Configuration

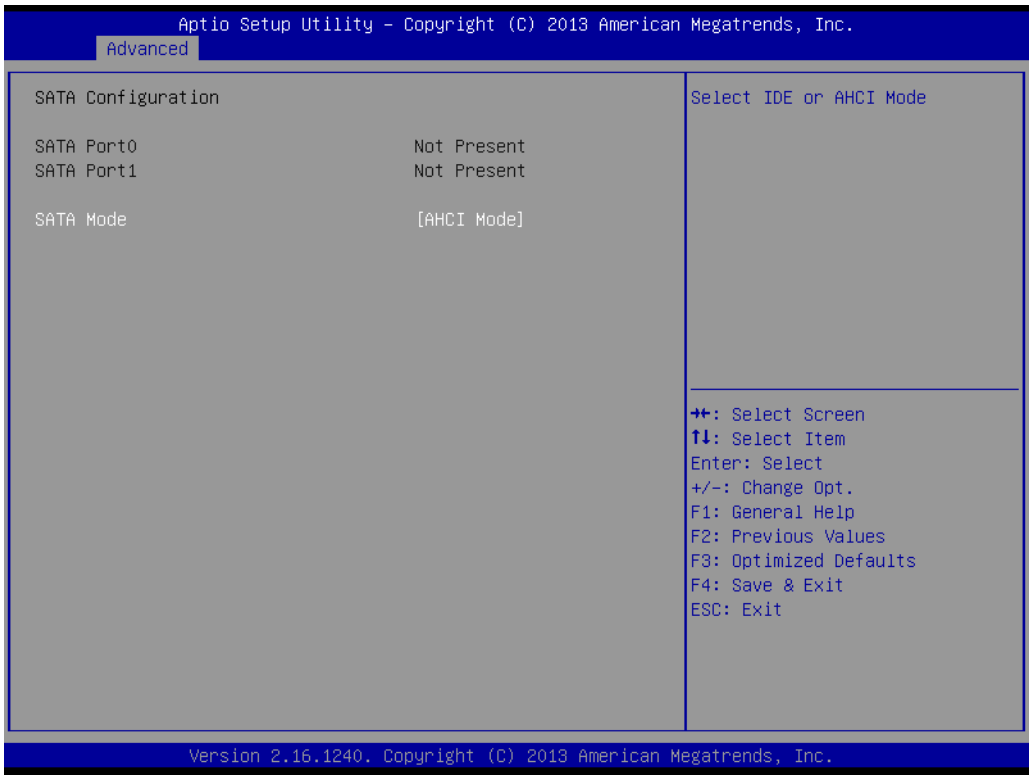


Figure 2.7 SATA configuration

- **SATA mode**
  This can be configured as Disabled, IDE or AHCI mode.
- **Disable**
  Disables the SATA function.
- **IDE mode**
  Set to [IDE mode] when you want to use the serial ATA hard disk drives as Parallel ATA physical storage devices.
- **ACHI mode**
  Set to [AHCI mode] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced serial ATA features that increase storage performance on random workloads by allowing the drive to internally optimize the order of commands.

2.3.2.5 USB Configuration

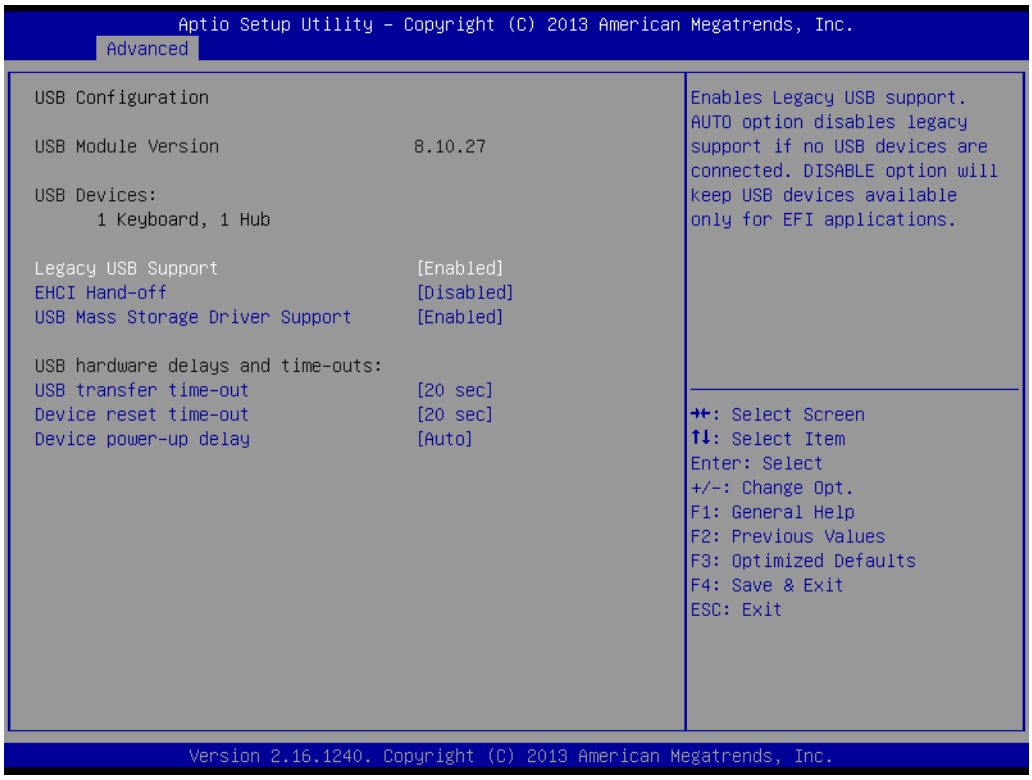

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced
USB Configuration
USB Module Version 8.10.27
USB Devices:
1 Keyboard, 1 Hub
Legacy USB Support [Enabled]
EHCI Hand-off [Disabled]
USB Mass Storage Driver Support [Enabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.8 USB configuration

- **Legacy USB Support**
  Enables legacy USB support. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-off**
  This is a workaround item for any OS without EHCI hand-off support.
- **USB Mass Storage Devices**
  Enable/Disable USB Mass Storage Support.
- **USB hardware delays and time-outs**
  The recommended settings are as in the figure above.

2.3.2.6 Cave Creek SIW Configuration

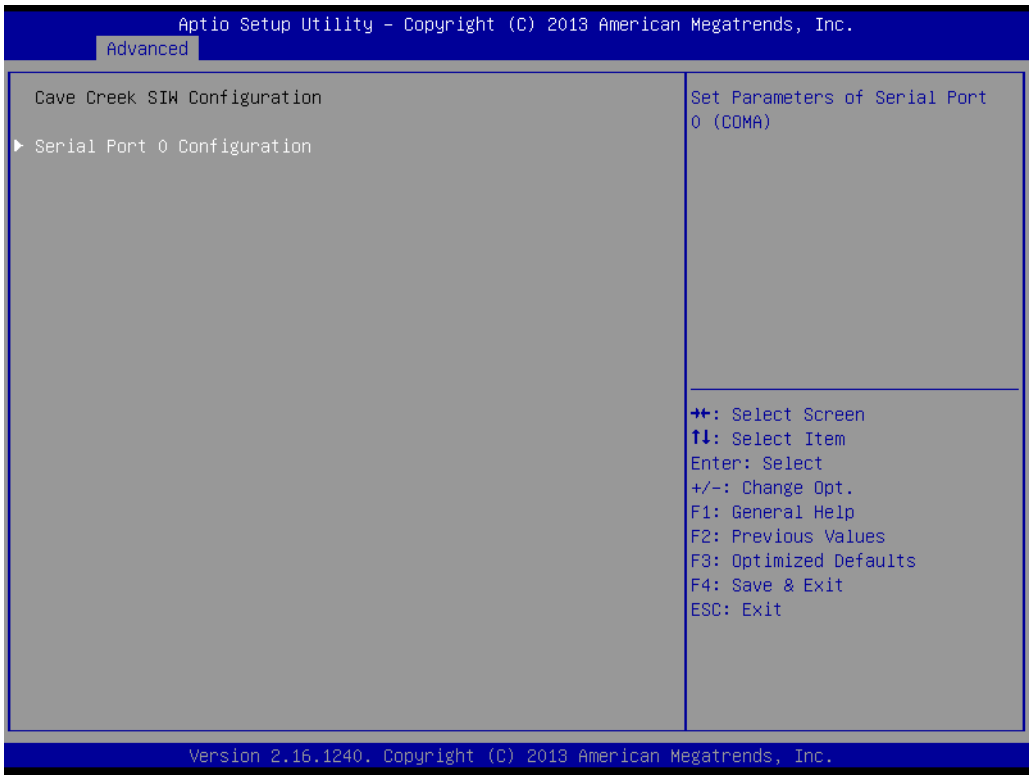
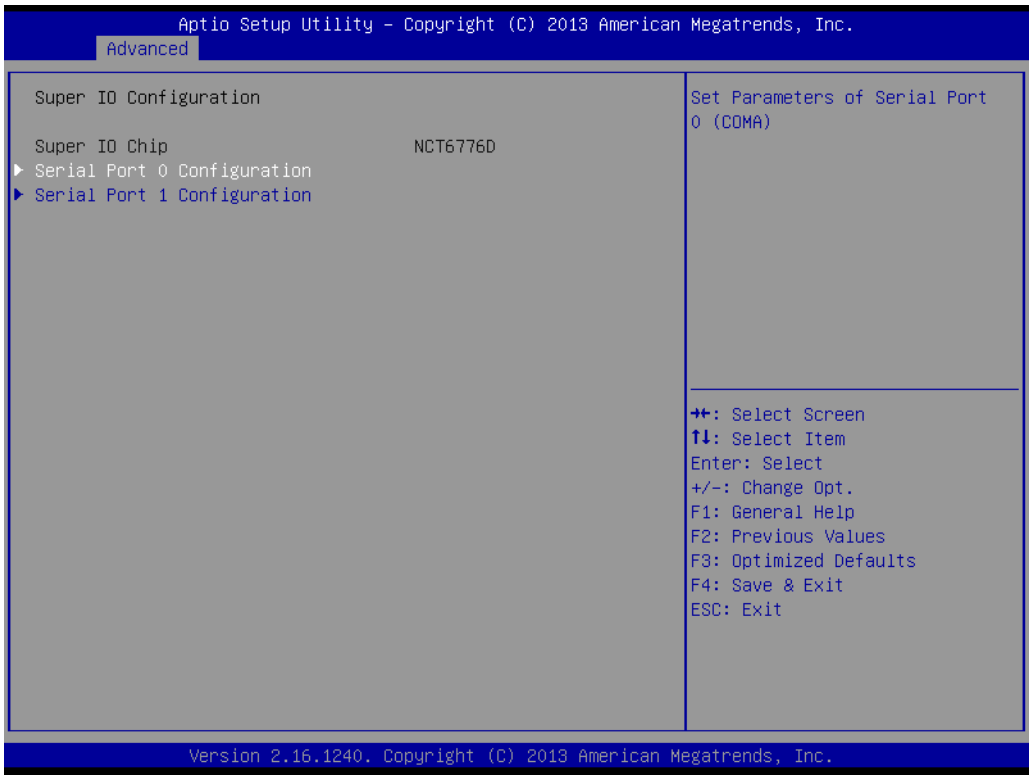

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced
Cave Creek SIW Configuration
Serial Port 0 Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.9 Cave Creek SIW Configuration

- **Serial Port 0 Configuration**

  Serial port 0 is from PCH chip Cave Creek. It allows users to set serial port 0 parameters by transfer mode from "RS232" to "RS422", default value is "RS232".

2.3.2.7 Super I/O Configuration



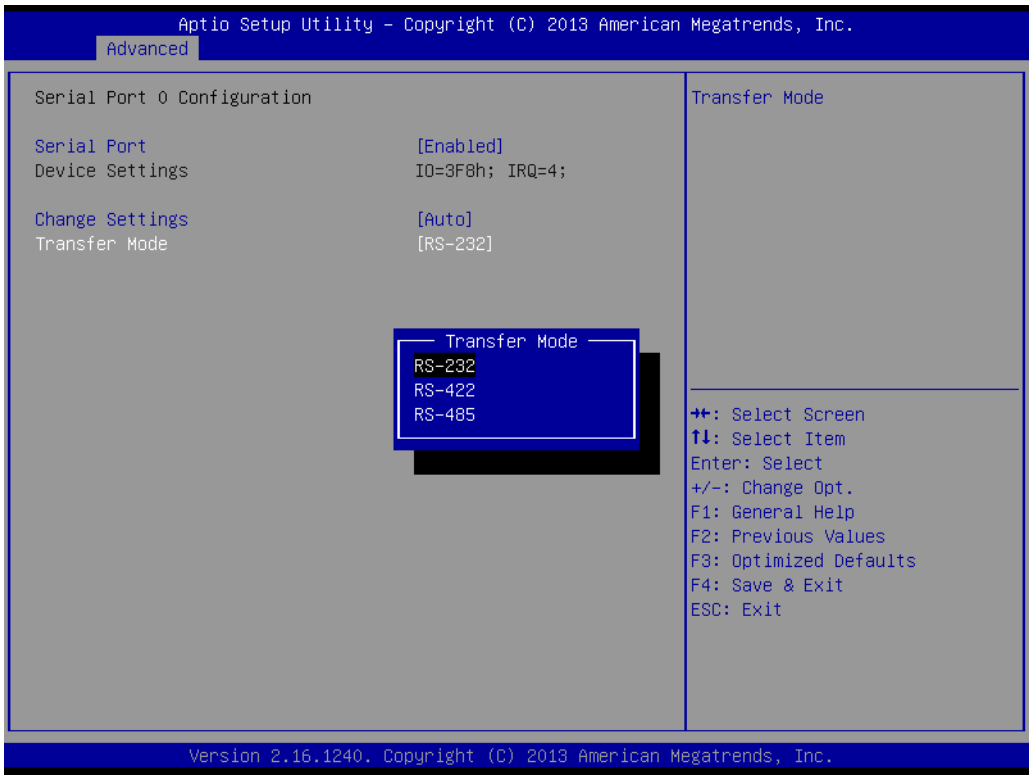


Figure 2.10 Super IO Configuration

- **Serial Port 0/1 Configuration**
  For serial port 0/1, IRQ/IO mode resource configuration, users can choose IRQ, IO and MODE.

- **Transfer Mode**

  It allows users to choose transfer mode as "RS232/422/485", default value is "RS232".

2.3.2.8 H/W Monitor Configuration

System temperature, CPU temperature and voltage status can be checked in PC Health Status.

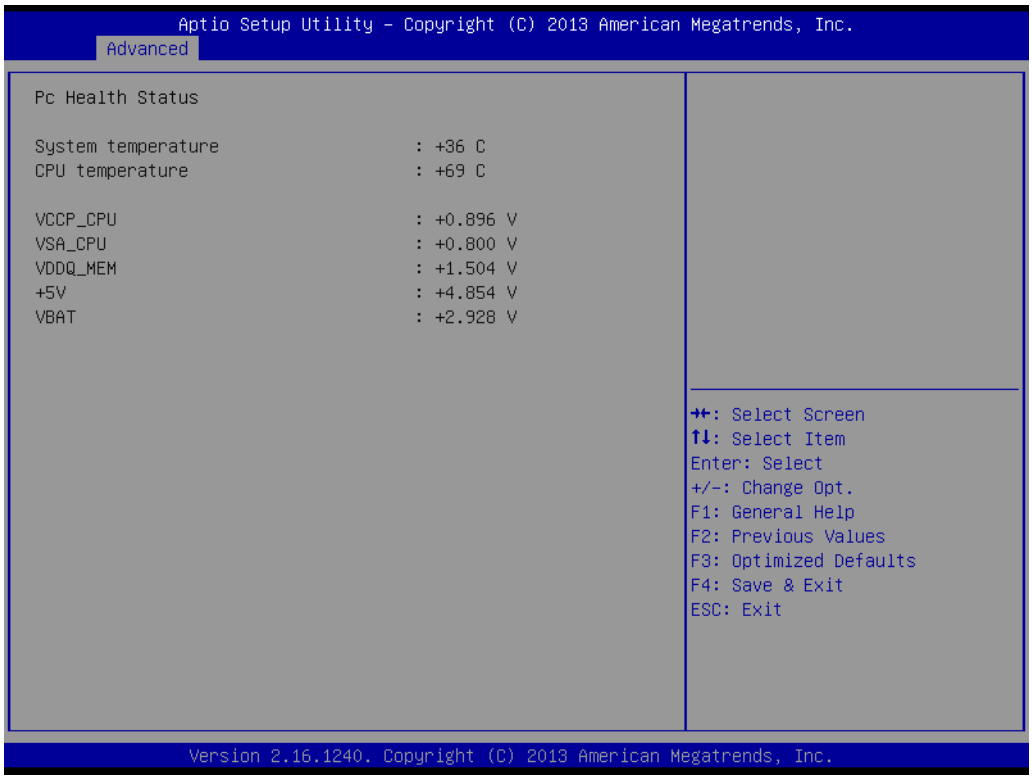


Figure 2.11 H/W Monitor configuration

2.3.2.9 Serial Port Console Redirection

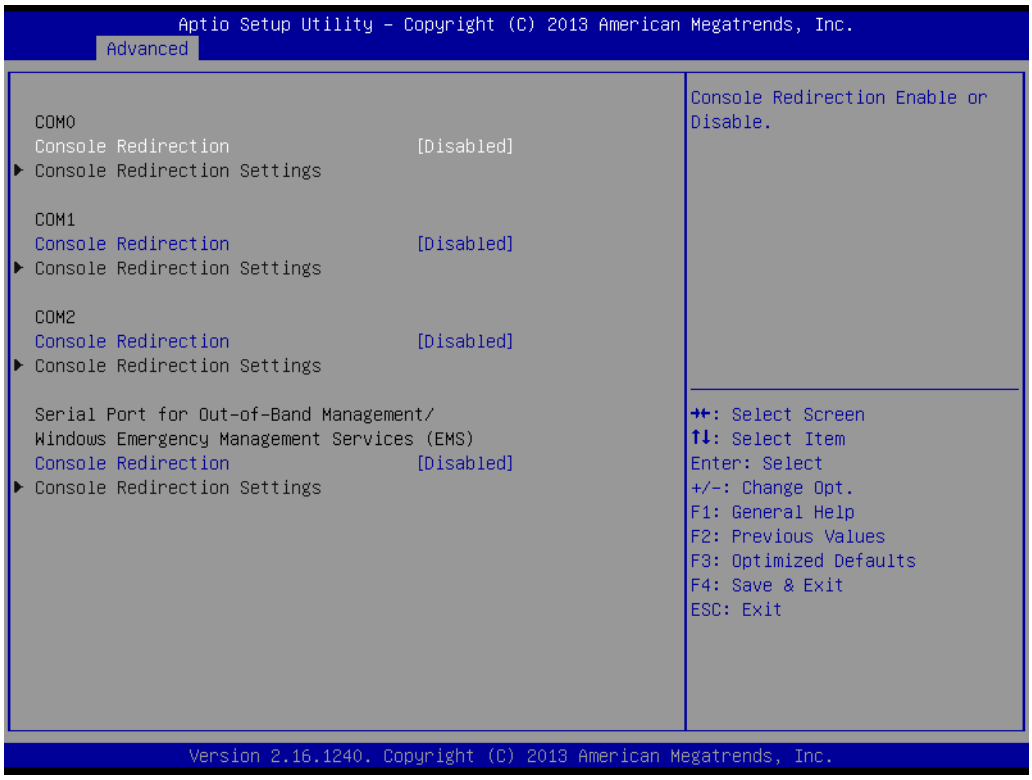


Figure 2.12 Serial Port Console Redirection configuration

- **Console Redirection**

  This item allows users to enable or disable console redirection or Microsoft Windows Emergency Management Services (EMS).

2.3.2.10 Network Stack

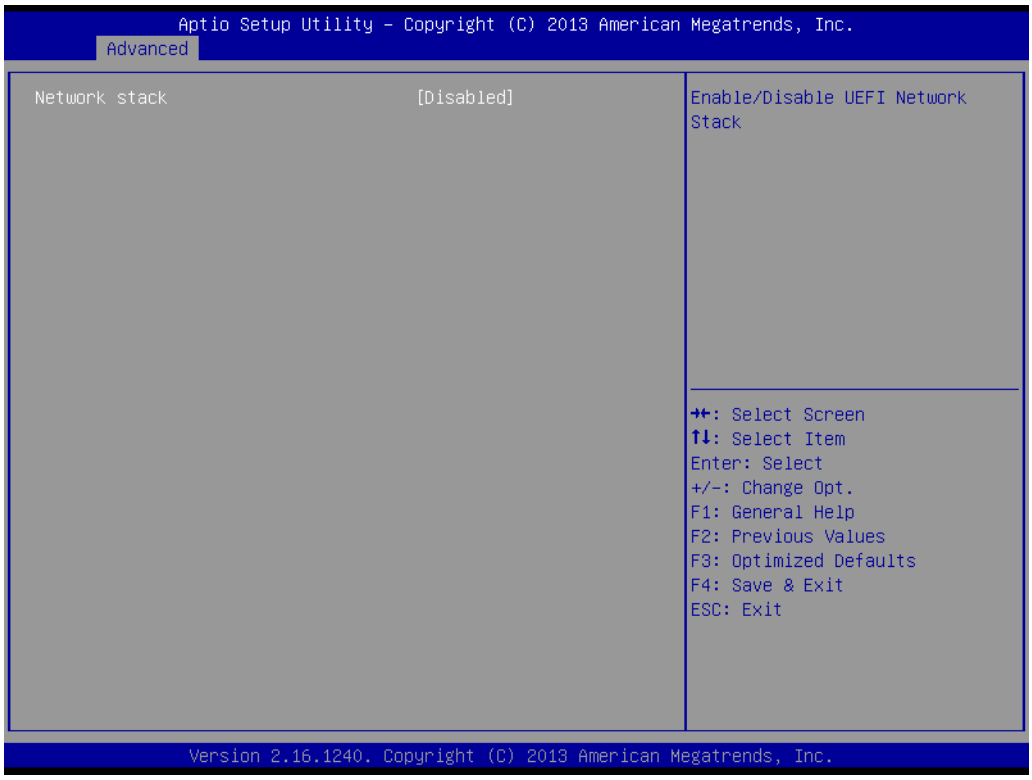


Figure 2.13 Network Stack configuration

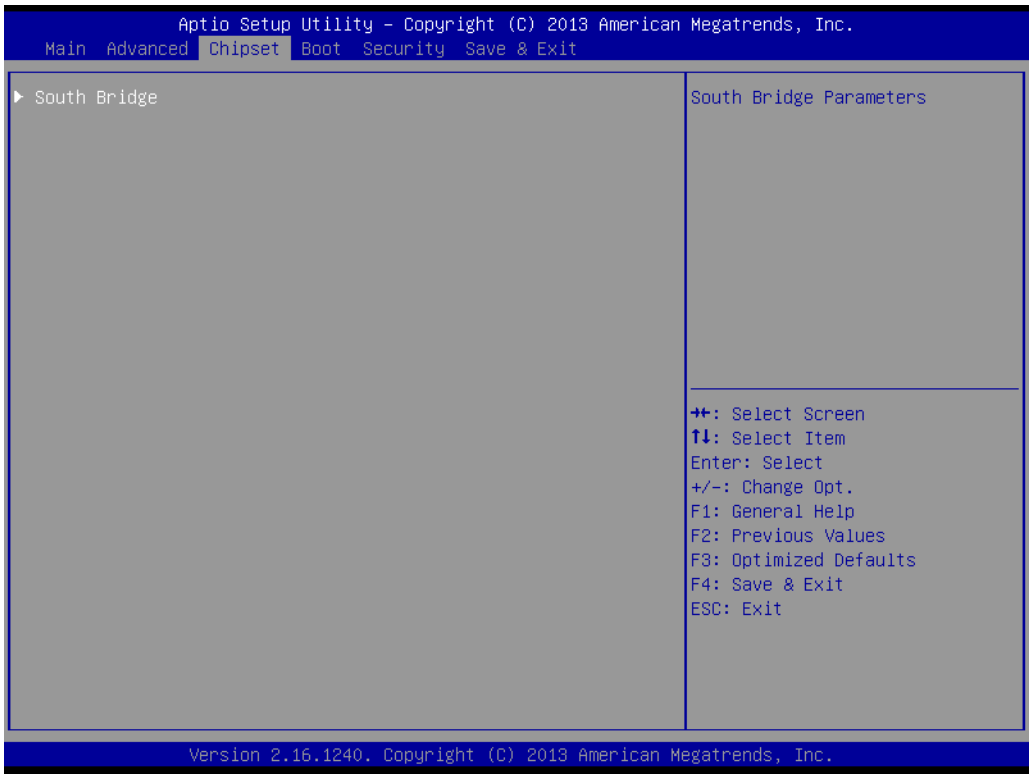
- **Network Stack**
  This option allows you to enable or disable the Network Stack function. The default setting is “Disabled”.

2.3.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen.

Users can select any item in the left frame of the screen to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

2.3.3.1 South Bridge


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
South Bridge
South Bridge Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Chipset
SB Chipset Configuration
Primary Display Controller [8HP Card]
Select which graphics controller to use as the primary boot device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.14 Chipset Configuration

- **Primary Display Controller**

  This offers two boot options for default primary display, SM750 means default display is from 4HP only while 8HP means default is from E6760 MXM graphics module.

- **Lan5 Selector**

  Lan 5 interface is switchable for front and rear, it allows users to choose LAN 5 output from 4HP front panel or from RTM.

2.3.4 Boot Setting

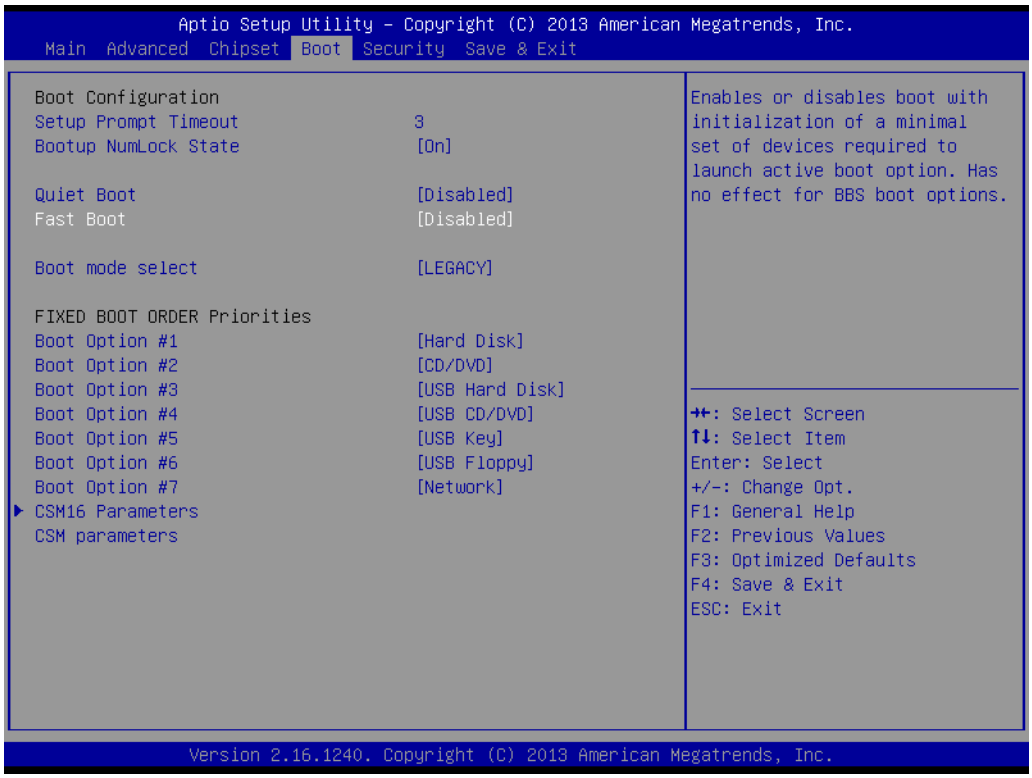

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Setup Prompt Timeout 3
Bootup NumLock State [On]
Quiet Boot [Disabled]
Fast Boot [Disabled]
Boot mode select [LEGACY]
FIXED BOOT ORDER Priorities
Boot Option #1 [Hard Disk]
Boot Option #2 [CD/DVD]
Boot Option #3 [USB Hard Disk]
Boot Option #4 [USB CD/DVD]
Boot Option #5 [USB Key]
Boot Option #6 [USB Floppy]
Boot Option #7 [Network]
CSM16 Parameters
CSM parameters
Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.15 Boot setup

- **Setup Prompt Timeout**
  This option allows you to set the delay time before setup hotkey works.
- **Bootup NumLock State**
  This setting automatically turns on NumLock key when the system is booted. The default setting is “on”.
- **Quiet Boot**
  If this option is set to Disabled, the BIOS displays normal POST messages. If enabled, an OEM Logo is shown instead of POST messages.
- **Fast Boot**
  This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **Boot Mode Select**
  This item allows users to select boot mode as "Legacy or UEFI".
- **Fixed Boot Order Priorities**
  The option shows device boot priorities.

CSM16 Parameters

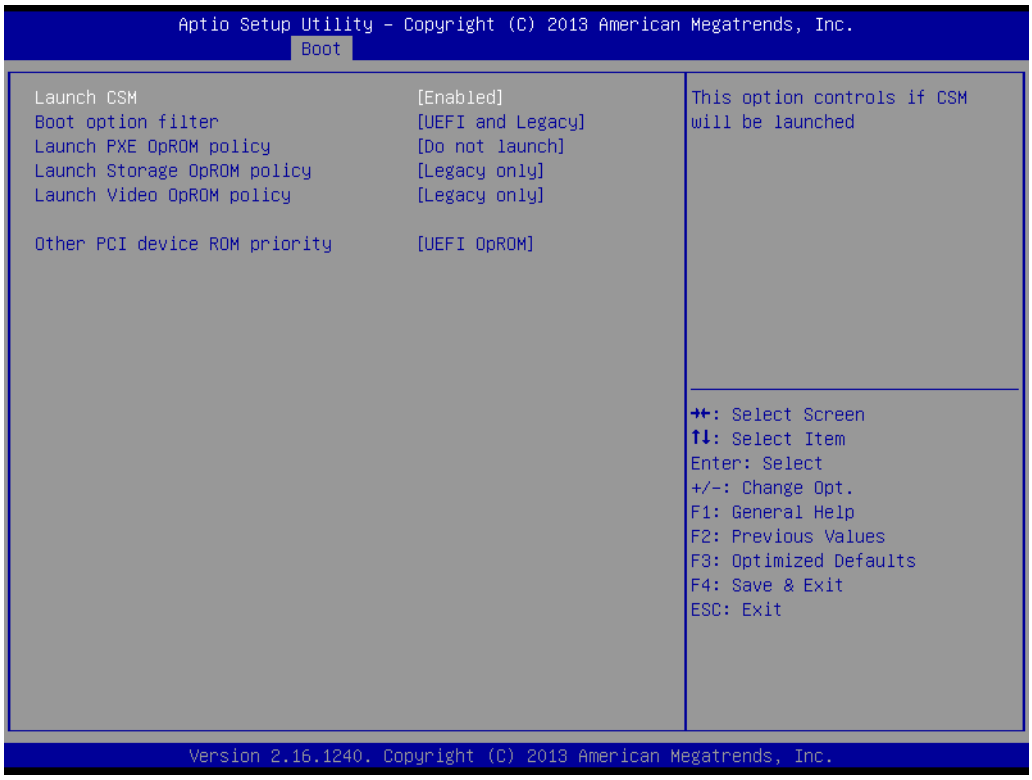
– **Option Messages**

  This option allows you to set the display mode for Option ROM with "Force BIOS" or "Keep Current". The default setting is "Force BIOS".

– **INT19 Trap Response**

  This option allows you to choose "Immediate" execute the trap right away or choose "Postponed" to execute the trap during legacy boot.

CSM Parameters


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Boot
Launch CSM [Enabled]
Boot option filter [UEFI and Legacy]
Launch PXE OpROM policy [Do not launch]
Launch Storage OpROM policy [Legacy only]
Launch Video OpROM policy [Legacy only]
Other PCI device ROM priority [UEFI OpROM]
This option controls if CSM will be launched
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

- **Launch CSM**
  This option controls whether CSM will be launched.
- **Boot option filter**
  This option controls what devices system can boot from.
- **Launch PXE OpROM policy**
  This option controls the execution of UEFI and Legacy PXE OpROM.
- **Launch storage oPROM policy**
  This option controls the execution of UEFI and Legacy Storage OpROM
- **Launch Video OpROM policy**
  This option controls the execution of UEFI and Legacy Video OpROM.
- **Other PCI device ROM priority**
  It is for devices other than Network, Mass storage or Video; it defines which OpROM to launch

Hard Drive BBS Priorities

This option specifies the boot device priority sequence from available hard disk drives.

2.3.5 Security Setup

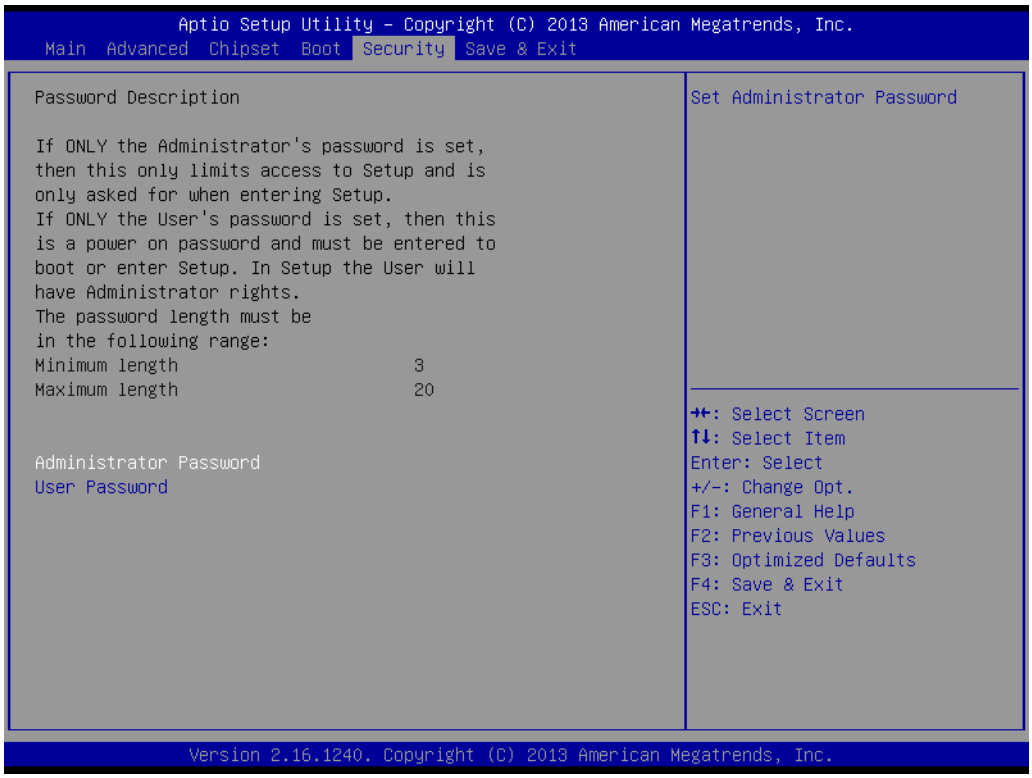
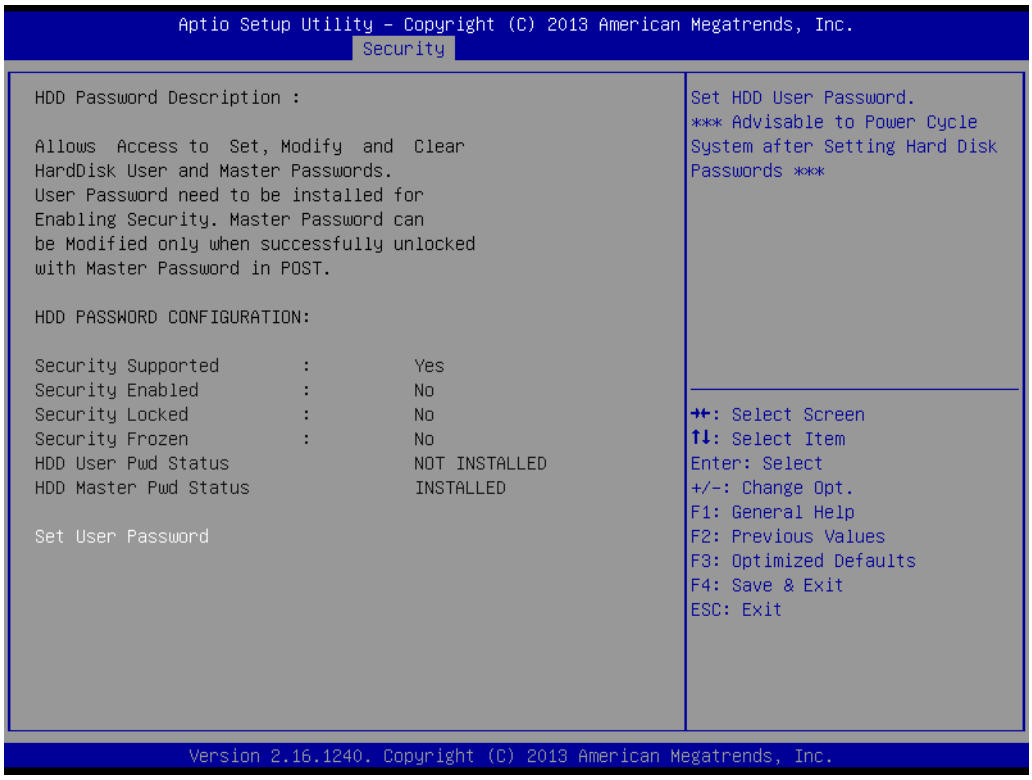

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.16 Password configuration

- **Administrator Password**
  Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the Administrator password.
- **User Password**
  Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the User Password.

HDD Security Configuration


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Security
HDD Password Description :
Allows Access to Set, Modify and Clear HardDisk User and Master Passwords. User Password need to be installed for Enabling Security. Master Password can be Modified only when successfully unlocked with Master Password in POST.
HDD PASSWORD CONFIGURATION:
Security Supported : Yes
Security Enabled : No
Security Locked : No
Security Frozen : No
HDD User Pwd Status NOT INSTALLED
HDD Master Pwd Status INSTALLED
Set User Password
Set HDD User Password.
*** Advisable to Power Cycle System after Setting Hard Disk Passwords ***
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

– **Set User Password**

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the HDD User Password.

2.3.6 Save & Exit Option

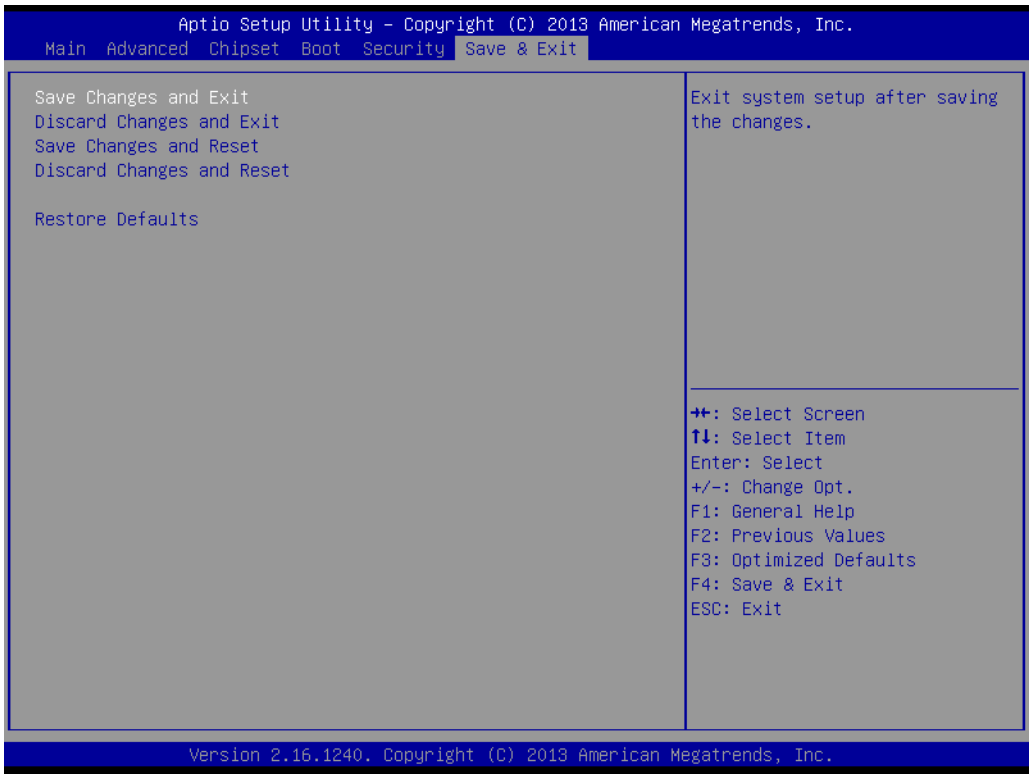

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Exit system setup after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Figure 2.17 Save and Exit configuration

- **Save Changes and Exit**

  When users have completed system configuration, select this option to save changes, exit BIOS setup menu and when reboot the computer to take effect all system configuration parameters.

  1. Select “Save Changes and Exit” and press <Enter>. The following message appears: Save Configuration and Exit? [Yes] [No]
  2. Select Yes or No.

- **Discard Changes and Exit**

  Select this option to quit Setup without making any permanent changes to the system configuration.

  1. Select “Discard Changes and Exit” and press <Enter>. The following message appears: Quit without saving? [Yes] [No]
  2. Select Yes to discard changes and exit.

- **Save Changes and Reset**

  1. Select this option to save the changes and reboot the computer, effecting all current system configuration parameters. The following message appears: Save Configuration and Reset? [Yes] [No]
  2. Select Yes or No.

- **Discard Changes and Reset**

  1. Select “Discard Changes and Reset” and press <Enter>. The following message appears: Reset without saving? [Yes] [No]
  2. Select Yes to discard changes and reset.

- **Restore Defaults**

  The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

Appendix A

Pin Assignments

This appendix describes pin assignments.

A.1 J1 Connector

Table A.1: J1 CompactPCI I/O						
-12V_HOT	C1	J1-TRST#	D1	+12V_HOT	E1	+5V_HOT
+5V_HOT	C2	J1-TMS	D2	+CPCI_VIO	E2	J1-TDI
J1INTB	C3	J1INTC	D3	+5V_HOT	E3	J1INTD
J1_HEALTHY#_R	C4	+CPCI_VIO	D4	INTP	E4	INTS
NC	C5	J1RST	D5	GND	E5	J1_GNT#0
+CPCI_VIO	C6	+3V_HOT	D6	J1_CLK0	E6	J1AD31
J1AD29	C7	J1AD28	D7	GND	E7	J1AD27
GND	C8	?	D8	J1AD25	E8	J1AD24
J1IDSEL	C9	J1AD23	D9	GND	E9	J1AD22
GND	C10	+3V_HOT	D10	J1AD20	E10	J1AD19
J1AD17	C11	J1AD16	D11	GND	E11	J1CBE2
KEY	C12	KEY	D12	KEY	E12	KEY
KEY	C13	KEY	D13	KEY	E13	KEY
KEY	C14	KEY	D14	KEY	E14	KEY
J1FRAME#	C15	J1IRDY#	D15	BD_SEL#	E15	J1TRDY#
J1_PCIXCAP	C16	+CPCI_VIO	D16	J1STOP#	E16	J1LOCK#
J1_SCL	C17	J1_SDA	D17	GND	E17	J1PERR#
GND	C18	+3V_HOT	D18	J1PAR	E18	J1CBE1
J1AD15	C19	J1AD14	D19	GND	E19	J1AD13
GND	C20	+CPCI_VIO	D20	J1AD11	E20	J1AD10
J1AD9	C21	J1AD8	D21	S_M66EN	E21	J1CBE0
GND	C22	+3V_HOT	D22	J1AD6	E22	J1AD5
J1AD4	C23	J1AD3	D23	+5V_HOT	E23	J1AD2
+5V_HOT	C24	+CPCI_VIO	D24	J1AD0	E24	J1AK64
J1RQ64	C25	J1_ENUM	D25	+3V_HOT	E25	+5V_HOT

Note! *NC: No Connect*

A.2 J2 Connector

Table A.2: J2 CompactPCI I/O									
A1	J1_CLK1	B1	GND	C1	J2_REQ#1	D1	J2_GNT#1	E1	J2_REQ#2
A2	J1_CLK2	B2	J1_CLK3	C2	SYSEN#	D2	J2_GNT#2	E2	J2_REQ#3
A3	J1_CLK4	B3	GND	C3	J2_GNT#3	D3	J2_REQ#4	E3	J2_GNT#4
A4	+CPCI_VIO	B4	NC	C4	J2-CBE7	D4	GND	E4	J2-CBE6
A5	J2-CBE5	B5	J2_64EN#	C5	+CPCI_VIO	D5	J2-CBE4	E5	J2_PAR64
A6	J1AD63	B6	J1AD62	C6	J1AD61	D6	GND	E6	J1AD60
A7	J1AD59	B7	GND	C7	+CPCI_VIO	D7	J1AD58	E7	J1AD57
A8	J1AD56	B8	J1AD55	C8	J1AD54	D8	GND	E8	J1AD53
A9	J1AD52	B9	GND	C9	+CPCI_VIO	D9	J1AD51	E9	J1AD50
A10	J1AD49	B10	J1AD48	C10	J1AD47	D10	GND	E10	J1AD46
A11	J1AD45	B11	GND	C11	+CPCI_VIO	D11	J1AD44	E11	J1AD43
A12	J1AD42	B12	J1AD41	C12	J1AD40	D12	GND	E12	J1AD39
A13	J1AD38	B13	GND	C13	+CPCI_VIO	D13	J1AD37	E13	J1AD36
A14	J1AD35	B14	J1AD34	C14	J1AD33	D14	GND	E14	J1AD32
A15	NC	B15	GND	C15	J2FAL#	D15	J2_REQ#5	E15	J2_GNT#5
A16	NC	B16	NC	C16	J2DEG#	D16	GND	E16	NC
A17	NC	B17	GND	C17	J2PRST#	D17	J2_REQ#6	E17	J2_GNT#6
A18	NC	B18	NC	C18	NC	D18	GND	E18	NC
A19	NC	B19	GND	C19	IPMB_PWR	D19	IPMB_PWR	E19	J2_ALERT#
A20	J1_CLK5	B20	NC	C20	NC	D20	GND	E20	NC
A21	J1_CLK6	B21	GND	C21	NC	D21	NC	E21	NC
A22	GA4	B22	GA3	C22	GA2	D22	GA1	E22	GA0

Note! *NC: No Connect*

A.3 J3 Connectors

PCIe port only supports x4 link.

Table A.3: J3 CompactPCI I/O (LAN 2.16)									
A1	GND	B1	GND	C1	+5V	D1	GND	E1	GND
A2	PE_CPU_J3_TXP0	B2	PE_J3_CPU_RXP0	C2	+5V	D2	PE_CPU_J3_TXP1	E2	PE_J3_CPU_RXP1
A3	PE_CPU_J3_TXN0	B3	PE_J3_CPU_RXN0	C3	+5V	D3	PE_CPU_J3_TXN1	E3	PE_J3_CPU_RXN1
A4	GND	B4	GND	C4	+5V	D4	GND	E4	GND
A5	PE_CPU_J3_TXP2	B5	PE_J3_CPU_RXP2	C5	BUF_PLT RST3#	D5	PE_CPU_J3_TXP3	E5	PE_J3_CPU_RXP3
A6	PE_CPU_J3_TXN2	B6	PE_J3_CPU_RXN2	C6	J3_TMS	D6	PE_CPU_J3_TXN3	E6	PE_J3_CPU_RXN3
A7	GND	B7	GND	C7	J3_TCK	D7	GND	E7	GND
A8	CLK_PCIE_J3+	B8	NC	C8	J3_TRST#	D8	NC	E8	NC
A9	CLK_PCIE_J3-	B9	NC	C9	J3_TDI	D9	NC	E9	NC
A10	GND	B10	NC	C10	J3_TDO	D10	NC	E10	NC
A11	GND	B11	NC	C11	+3V3	D11	NC	E11	NC
A12	SATA4_TX+	B12	SATA4_RX+	C12	+3V3	D12	SATA5_TX+	E12	SATA5_RX+
A13	SATA4_TX-	B13	SATA4_RX-	C13	+3V3	D13	SATA5_TX-	E13	SATA5_RX-
A14	GND	B14	GND	C14	+3V3	D14	GND	E14	GND
A15	J3_MDIB1+	B15	J3_MDIB1-	C15	GND	D15	J3_MDIB3+	E15	J3_MDIB3-
A16	J3_MDIB0+	B16	J3_MDIB0-	C16	GND	D16	J3_MDIB2+	E16	J3_MDIB2-
A17	J3_MDIA1+	B17	J3_MDIA1-	C17	GND	D17	J3_MDIA3+	E17	J3_MDIA3-
A18	J3_MDIA0+	B18	J3_MDIA0-	C18	GND	D18	J3_MDIA2+	E18	J3_MDIA2-
A19	NC	B19	NC	C19	RIO_SATA_LED#	D19	NC	E19	NC

Note! *NC: No Connect*

A.4 J5 Connector

Table A.4: J5 CompactPCI I/O									
A1	J5_MDIA0+	B1	J5_MDIA0-	C1	GND	D1	J5_MDIA1+	E1	J5_MDIA1-
A2	J5_MDIA2+	B2	J5_MDIA2-	C2	GND	D2	J5_MDIA3+	E2	J5_MDIA3-
A3	J5_MDIB0+	B3	J5_MDIB0-	C3	GND	D3	J5_MDIB1+	E3	J5_MDIB1-
A4	J5_MDIB2+	B4	J5_MDIB2-	C4	GND	D4	J5_MDIB3+	E4	J5_MDIB3-
A5	NC	B5	NC	C5	NC	D5	NC	E5	NC
A6	NC	B6	NC	C6	NC	D6	VCC_USB5	E6	VCC_USB4
A7	NC	B7	NC	C7	NC	D7	USBD5+	E7	USBD4+
A8	NC	B8	NC	C8	J5_MSDAT	D8	USBD5-	E8	USBD4-
A9	NC	B9	NC	C9	J5_MSCLK	D9	GND	E9	GND
A10	NC	B10	NC	C10	J5_PS2PWR	D10	VCC_USB6	E10	DDC_DAT3
A11	NC	B11	NC	C11	J5_KBDAT	D11	USBD6+	E11	DDC_CLK3
A12	NC	B12	NC	C12	J5_KBCLK	D12	USBD6-	E12	J5_VGAPWR
A13	NC	B13	NC	C13	NC	D13	GND	E13	REAR_VSYNC
A14	NC	B14	NC	C14	P5_LINK1000	D14	NC	E14	REAR_HSYNC
A15	NC	B15	NC	C15	P5_LINK100	D15	NC	E15	REAR_RED
A16	LAN5_LINK1000#	B16	LAN6_LINK100#	C16	P5_LED_LINK	D16	NC	E16	REAR_GREEN
A17	LAN5_LINK100#	B17	LAN6_LINK1000#	C17	LAN4_LINK100#	D17	GND	E17	REAR_BLUE
A18	LAN5_LINK-ACT#	B18	LAN6_LINK-ACT#	C18	LAN4_LINK1000#	D18	NC	E18	GND
A19	RIO_COM1_RX#	B19	RIO_COM1_CTS#	C19	LAN4_LINK-ACT#	D19	RIO_COM2_DCD#	E19	RIO_COM2_TX#
A20	RIO_COM1_TX1	B20	RIO_COM1_DSR#	C20	RTM_PRES#	D20	RIO_COM2_RTS#	E20	RIO_COM2_DTR#
A21	RIO_COM1_RTS#	B21	RIO_COM1_DTR#	C21	NC	D21	RIO_COM2_CTS#	E21	RIO_COM2__RI#
A22	RIO_COM1_DCD#	B22	RIO_COM1_RI#	C22	NC	D22	RIO_COM2_DSR#	E22	RIO_COM2_RX#

A.5 Other Connectors

Table A.5: CNXTM1 Connector			
1	GND	2	GND
3	PE_XTM_SW_RXP0	4	PE_XTM_SW_RXP1
5	PE_XTM_SW_RXN0	6	PE_XTM_SW_RXN1
7	GND	8	GND
9	PE_XTM_SW_RXP2	10	PE_XTM_SW_RXP3
11	PE_XTM_SW_RXN2	12	PE_XTM_SW_RXN3
13	GND	14	GND
15	PE_XTM_SW_RXP4	16	PE_XTM_SW_RXP5
17	PE_XTM_SW_RXN4	18	PE_XTM_SW_RXN5
19	GND	20	GND
21	PE_XTM_SW_RXP6	22	PE_XTM_SW_RXP7
23	PE_XTM_SW_RXN6	24	PE_XTM_SW_RXN7
25	GND	26	GND
27	PCH_WAKE#	28	XTM_PLTRST#
29	XTM_GPIO1	30	GND
31	XTM_GPIO2	32	MXM_TH_OVERT#
33	GND	34	3VSBPWM_EN
35	XTM_PWREN	36	3VSB_EN
37	+3V3	38	MXM_PWROK
39	+3V3	40	MXM_PWR_EN
41	+3V3	42	+5V
43	+3V3	44	+5V
45	GND	46	GND
47	PE_XTM_SW_TXP0	48	PE_XTM_SW_TXP1
49	PE_XTM_SW_TXN0	50	PE_XTM_SW_TXN1
51	GND	52	GND
53	PE_XTM_SW_TXP2	54	PE_XTM_SW_TXP3
55	PE_XTM_SW_TXN2	56	PE_XTM_SW_TXN3
57	GND	58	GND
59	PE_XTM_SW_TXP4	60	PE_XTM_SW_TXP5
61	PE_XTM_SW_TXN4	62	PE_XTM_SW_TXN5
63	GND	64	GND
65	PE_XTM_SW_TXP6	66	PE_XTM_SW_TXP7
67	PE_XTM_SW_TXN6	68	PE_XTM_SW_TXN7
69	GND	70	GND
71	CLK_100M_XTM_PEG_DP	72	SMBDAT1
73	CLK_100M_XTM_PEG_DN	74	SMBCLK1
75	GND	76	GND
77	+5V	78	XTM_PRESENT#
79	+5V	80	GND

Table A.6: SPI1/SPI2 Connector			
1	SPI_R_CS#0	1	SPI_R_CS#1
2	SPI_SO0	2	SPI_SO1
3	FWH1_WP#	3	FWH2_WP#
4	GND	4	GND
5	SPI_SI0	5	SPI_SI1
6	SPI_S_CK0	6	SPI_S_CK1
7	SPI_HD0	7	SPI_HD1
8	+3V3_SB	8	+3V3_SB

Appendix B

Programming the Watchdog Timer

This appendix describes how to program the watchdog timer.

B.1 Watchdog Timer Programming Procedure

To program the watchdog timer, you must execute a program that writes a value to I/O port address 443/444 (hex) for Enable/Disable. This output value represents time interval. The value range is from 01 (hex) to FF (hex), and the related time interval is 1 to 255 seconds.

Data	Time Interval
01	1 sec
02	2 sec
03	3 sec
04	4 sec
	...
3F	63 sec
	etc.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 and 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 444 (hex).

Appendix C

FPGA

This appendix describes FPGA configuration.

C.1 Features

- Power Sequence
- Hot-Swap: Hot insertion and removal control
- LPC Bus: Provide LPC Bus access
- Watchdog
- 2x SPI Cross-Switch: Dedicated SPI cross-switch for BIOS
- Debug Message: Boot time POST message

C.2 FPGA I/O Registers

The Advantech MIC-3397 FPGA communicates with main I/O spaces. The LPC unit is used to interconnect the Intel LPC signals. The Debug Port Unit is used to decode POST codes. The Watchdog is used to detect BIOS ready signal or recover BIOS code from redundant BIOS flash. The Hot-Swap Out-Of-Service LED Control Unit is used to control the blue LED during Hot-Insert and Hot-Remove. The other signals in the Miscellaneous Unit are for interfacing with corresponding I/O interface signals.

LPC Address	I/O Type	Description
0x80h	W	Port 80 Display
0x440h	R	FPGA minor revision ID
0x441h	R	Watch Dog Timer Display
0x442h	R	BIOS Switch display
0x443h/0x 444h	RW	Watchdog Register
0x445h	R	FPGA major revision
0x447h	R	Geography Address (GA)

Appendix D

Glossary

D.1 Glossary

ACPI	Advanced Configuration and Power Interface
CPU	Central Processing Unit
CPCI	CompactPCI
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
ECC	Error Checking and Correction
EEPROM	Electrically Erasable Programmable Read-Only Memory
EMC	Electro Magnetic Compatibility
ESD	Electro Static Discharge
HDD	Hard Disk Drive
HW	HardWare
I/O	Input/Output
IC	Integrated Circuit
IMCH	Integrated Memory Controller Hub
LED	Light Emitting Diode
LPC	Low Pin Count
LV	Low Voltage
MAC	Medium Access Control
OS	Operating System
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PCIe	Peripheral Component Interconnect Express
PHY	Physical layer Interface
RIO	Rear Input/Output
RS-232	An Interface specified by Electronic Industries Alliance
RTC	Real Time Clock
RTM	Rear Transition Module
SBC	Single Board Computer
SDRAM	Synchronous DRAM
SFP	Small Form-factor Pluggable
SPD	Serial Presence Detect
SPI	Serial Peripheral Interface
SSD	Solid State Disk
SW	SoftWare
ULV	Ultra Low Voltage
XMC	PCIe Interface Mezzanine Card
XTM	Extension Module

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